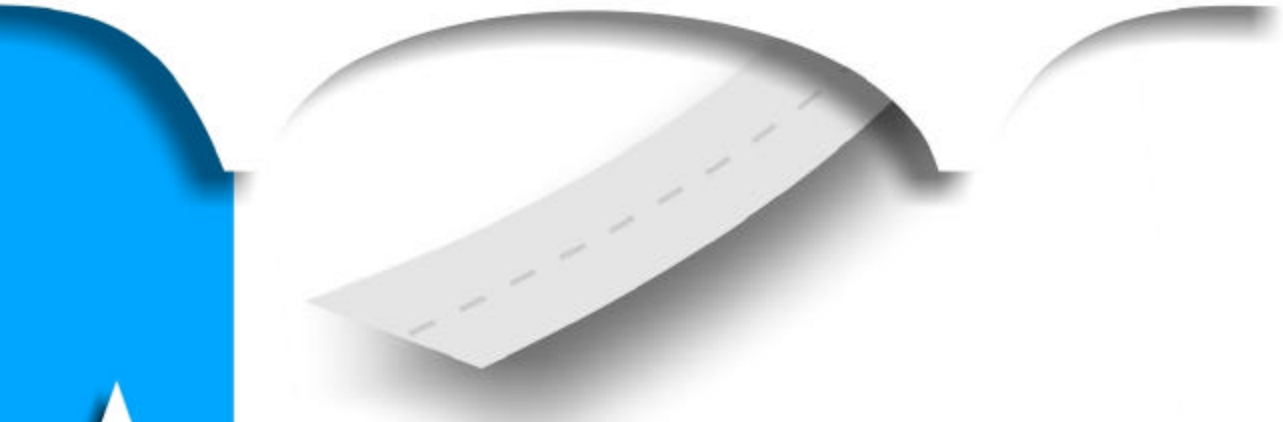
Report on Texas Bridges



as of September 2002

Report on

Texas Bridges

as of September 2002

Prepared by the Bridge Division
Texas Department of Transportation

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Executive Summary

This report describes Texas bridges and their condition as of September 2002 based on information in the Bridge Inspection Database, the Unified Transportation Program (UTP) planning document, and the Design and Construction Information System (DCIS). It describes bridges categorized by location either on or off the state highway system, by age, by type, and by main-span material. It describes the condition of Texas bridges in terms of sufficiency: sufficient bridges, structurally deficient bridges, functionally obsolete bridges, and sub-standard-for-load-only bridges. This report tracks annual progress toward TxDOT's goals to make at least 80% of Texas bridges good or better by September 2011 and to accelerate the upgrade of all structurally deficient on-system bridges, prioritizing critically deficient bridges, to eliminate all structurally deficient on-system bridges.

Texas had 48,216 bridges in September 2002, and their condition at that time is shown by the following figure (same as Figure 3-2).

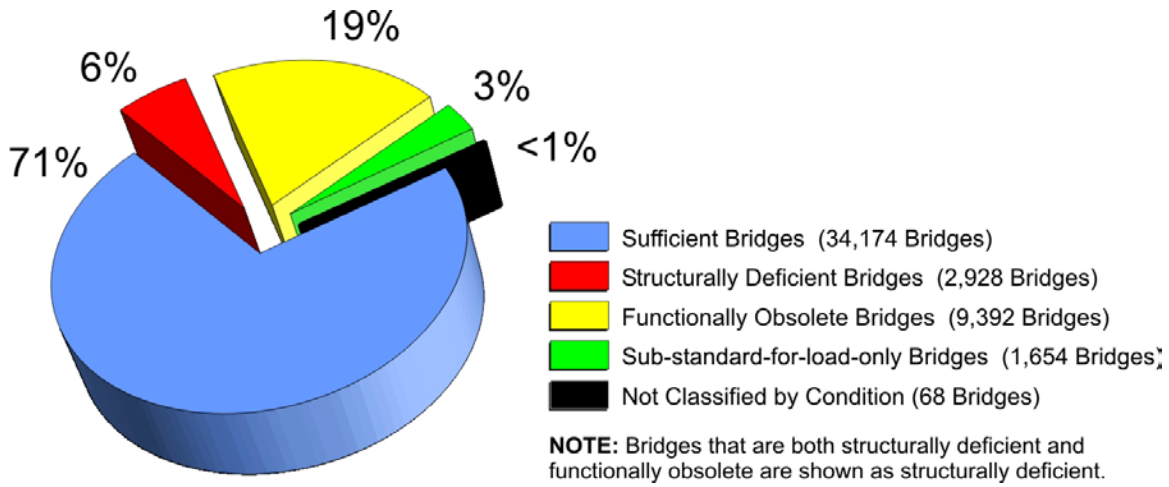


Figure ES-1. Condition of Texas Bridges by Count in September 2002 (48,216 Bridges Total)

During FY 2002, the number of sufficient bridges increased by 365—37 additional sufficient on-system bridges and 328 additional sufficient off-system bridges.

Of the non-sufficient bridges in Texas, FY 2002 produced a net improvement of 218 bridges, as shown by the negative numbers in the following table. This improvement encompassed 55 more non-sufficient on-system bridges, with all of the additional non-sufficient on-system bridges classified as functionally obsolete, but 273 fewer non-sufficient off-system bridges.

Table ES-1. Change in Condition of Non-sufficient Bridges during FY 2002

Condition	Change On-system	Change Off-system	Total Change
Structurally Deficient	–70	–198	–268
Functionally Obsolete	+194	–8	+186
Sub-standard for load only	–69	–67	–136
Total Change	+55	–273	–218

Change in the condition of non-sufficient Texas bridges during FY2002 is shown in the following figure (same as Figure 3-5).

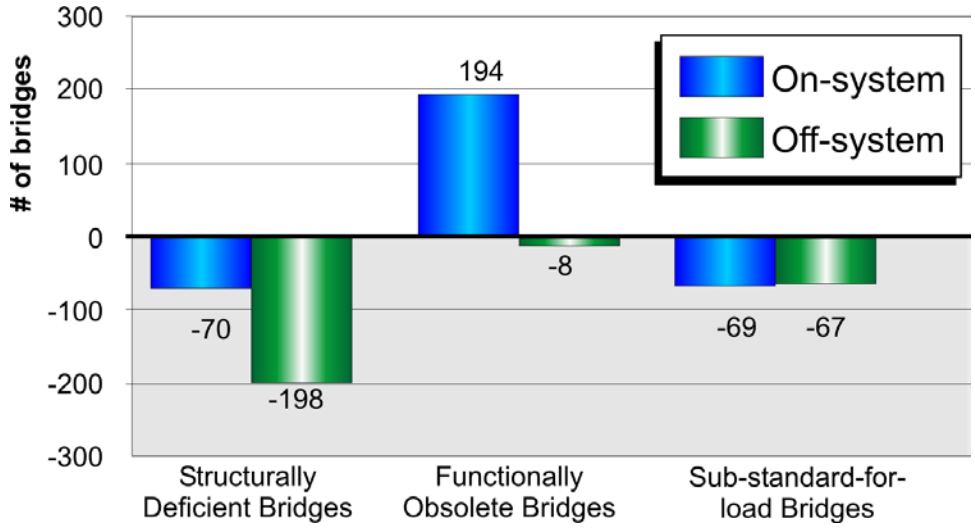


Figure ES-2. Change in Condition of Non-sufficient Bridges during FY 2002

Although the number of sufficient bridges in Texas increased in FY 2002 by 367, new-location bridges accounted for 132 of that number, and the percentage of sufficient bridges has increased only slightly from 69.9% in September 2000 to 70.3% in September 2001 and to 70.9% in September 2002.

This report distinguishes bridges by type, between span-type bridges and bridge-class culverts. Unlike bridge-class culverts, span-type bridges usually have decks and are more complex. As shown in Table 3-7, of the span-type bridges the number of structurally deficient on-system span-type bridges decreased by 63 from September 2001 to September 2002, and the number of structurally deficient off-system span-type bridges decreased by 210 from September 2001 to September 2002. Nevertheless, in September 2002 most of the structurally deficient span-type bridges were still off-system: 622 on-system and 2,161 off-system. However, as shown in Tables 4-4 and 4-6, most of the structurally deficient span-type bridge deck area was on-system: 9,703,126 sq. ft. on-system and 3,787,927 sq. ft. off-system. This reflects the fact that on-system bridges tend to be larger than off-system bridges and are correspondingly more expensive to replace or rehabilitate.

During FY 2002, Texas contracted projects to address 180 structurally deficient bridges and 65 functionally obsolete bridges for a total of 245 deficient or obsolete bridges. To achieve the goals to make at least 80% of Texas bridges good or better and to accelerate the upgrade of all structurally deficient on-system bridges, TxDOT and local governments must work more

effectively to meet challenges:

- 693 structurally deficient on-system bridges and 3,706 additional bridges classified as structurally deficient, functionally obsolete, or sub-standard for load only in September 2002, for a total of 4,399, must be improved. This is an average of 489 structurally deficient on-system and other non-sufficient bridges per year over the next nine years.
- Bridges that will become structurally deficient, functionally obsolete, or sub-standard for load only in the coming years must also be improved. Over 59% of bridges have been in service for more than 30 years. Increasing traffic volumes, heavier vehicle weights, and an aging infrastructure are increasing the need for additional funds and resources for maintenance, rehabilitation, and replacement of Texas bridges.

The following programs made funds available or facilitated upgrades of non-sufficient bridges:

- Highway Bridge Replacement and Rehabilitation Program (HBRRP)—TxDOT has administered this Federal Highway Administration (FHWA) program since its beginning in 1970. Initial funding participation requirements for both on- and off-system bridges were 80% federal and 20% local; however, in 1995 TxDOT initiated a change in participation requirements for off-system bridges to pay half of the local government's share (80% federal, 10% state, 10% local). This program provided funding for 170 structurally deficient and 34 functionally obsolete bridges that were contracted in FY 2002, for a total of 204 of the 245 deficient or obsolete bridges that were awarded contracts in FY 2002.
- State Infrastructure Bank (SIB)—Effective September 1997, this revolving account in the State Highway Fund allows TxDOT to award loans to local governments to support eligible transportation projects.
- Economically Disadvantaged Counties (EDC) Program—Effective January 1998, this program allows TxDOT to adjust a county's matching funds requirements after evaluating the local government's ability to meet the requirement. TxDOT also allows a county participating in the EDC program to use its adjusted participation amount in lieu of all or part of its 10% cost participation in the Participation-Waived Project/Equivalent-Match Project (PWP/EMP) program.
- PWP/EMP Program—Effective August 2000, revised local participation requirements allow 100% federal/state funding of a TxDOT-programmed participation-waived project (PWP) in cases where the local government agrees to perform structural improvement work on other equivalent-match-project (EMP) deficient bridges with a dollar amount at least equal to their normal 10% project match. State design standards apply to the PWPs while the EMP design standards are determined by the local governments based on local needs and standards.
- Simplified local government participation—Effective August 2000, when the local government elects to participate in the cost of a TxDOT-programmed bridge, instead of being responsible for 10% of actual costs, the local government is now responsible for 10% of the estimated project cost at the time the agreement with TxDOT is signed. The local government no longer participates in subsequent overruns in costs of program-eligible project items unless it lets and manages the project.
- Regional Mobility Authorities (RMAs)—Counties are beginning to explore bridge funding through RMAs for toll facilities.

As of September 2002, Texas must upgrade 489 structurally deficient on-system and other non-sufficient bridges each year—compared to 466 as of September 2001—to reach its goals of at

least 80% of Texas bridges in good or better condition and no structurally deficient on-system bridges.

TxDOT is adhering to the following plan to achieve its goals and is adjusting it annually after reviewing the effect of the preceding year's work on progress toward the goals:

- Develop and distribute an annual report to identify progress toward achieving the goal.
  Status: This report serves that purpose.
- Use the annual report to adjust the resources each year as needed.
  Status: Data compiled during development of the first issue of this report, *Report on Texas Bridges as of September 2001*, supported development of a new prioritization, currently in early stages of implementation, of bridge work for the 12-month letting schedule:
  Priority 1 – Critically deficient land-locking bridges
  Priority 2 – Remaining critically deficient bridges
  Priority 3 – Structurally deficient land-locking bridges
  Priority 4 – Remaining structurally deficient bridges
  Priority 5 – Functionally obsolete land-locking bridges
  Priority 6 – Remaining functionally obsolete bridges
- Produce completed bridge plans, specifically targeting those structurally deficient on-system bridges that are critically deficient, that will be available to substitute for delayed HBRRP projects.
  Status: TxDOT's Bridge Division and districts are working together, with support from the Bridge Division bridge design consultant pool, to target these bridges for plan development.
- Produce completed bridge plans, targeting structurally deficient off-system bridges that will be available to substitute for delayed HBRRP projects.
  Status: TxDOT's Bridge Division is now working with the districts to develop a backlog of projects to substitute for delayed HBRRP projects.
- Develop a process to substitute HBRRP projects for those that are delayed for letting to construction in order to contract 100 percent of HBRRP program funds on the 12-month HBRRP letting schedule each fiscal year.
  Status: HBRRP projects will begin to be scheduled in the first eight months of each fiscal year to allow sufficient time to substitute projects that are delayed to letting.
- Use other categories of funding in addition to HBRRP funds to achieve the goals.
  Status: TxDOT's Bridge Division and districts have increased emphasis on using additional categories of funding for bridge replacement and rehabilitation.
- Standardize additional bridge elements and make them available on the Internet in order to simplify design, speed construction, and lower costs.
  Status: During FY 2002, TxDOT updated existing online standard drawings and began work on standardization for two new bridge elements: concrete slab spans and box beams.
- Increase the use of cluster contracts that address two or more deficient bridges within a reasonable geographical area. This should lower overall design and construction costs.
  Status: TxDOT's Bridge Division and districts have increased emphasis on cluster contracts.
- Use maintenance funds to address on-system bridge problems that result in low condition ratings to prevent non-structurally deficient on-system bridges from becoming structurally deficient.
  Status: As shown in Figure 6-1, TxDOT distributed $57.2 M for on-system bridge maintenance in FY 2002, compared to $57.6 M in FY 2001.

Chapter 1 – Overview

Introduction. In August 2001, Texas Transportation Commissioner John W. Johnson established the TxDOT goal[1] that within ten years at least 80% of the bridges in Texas would be in good or better condition. Structurally deficient, functionally obsolete, and sub-standard-for-load-only bridges need improvement and, therefore, are not in good or better condition. Classification of bridges by these conditions, which are described in Chapter 3, is based on regularly scheduled bridge safety inspections.

As part of the September 2001 evaluation of Texas bridges, TxDOT adopted an additional goal to accelerate the upgrade of all structurally deficient on-system bridges, prioritizing critically deficient bridges, in an effort to eliminate all structurally deficient on-system bridges.

The TxDOT Bridge Division tracks progress toward both goals in an annual report on the condition of state bridges:

- *Report on Texas Bridges as of September 2001*—Baseline information showing the state of the bridges at the end of FY 2001.
- *Report on Texas Bridges as of September 2002*—This report.

Purpose. This report describes the condition of all publicly owned vehicular bridges in Texas in FY 2002. It provides the following information:

- Chapter 2—Characteristics of Texas bridges, categorized by location on or off the state highway system, by age, by type, and by main-span material.
- Chapters 3 and 4—Condition of the bridges and changes from the preceding year.
- Chapters 5 and 6—Status of funding and letting of bridge projects at the end of FY 2002.
- Chapter 7—Concerns for the future of Texas bridges based on their attributes and conditions.
- Chapter 8—Summaries of progress made toward TxDOT's bridge goals and of innovations and best practices in the preceding year.

Data Source. TxDOT maintains its inspection information on each publicly owned vehicular bridge in the electronic Bridge Inspection Database. This database is a repository of information on the characteristics of the bridges and their conditions, and it provides the source of data for descriptions of bridges in this annual report. The database identifies each bridge by its National Bridge Inventory (NBI) number.

TxDOT uses the Unified Transportation Program (UTP), a ten-year planning document, to guide and control project development. It identifies Texas projects scheduled to be let for construction bids and is typically updated and re-issued yearly. The UTP provides the source of data for funding information in this annual report.

[1] Texas Transportation Commission's Transportation Working Group, "Texas Transportation Partnerships: Connecting You to the World," August 2001.

TxDOT uses an automated information system—the Design and Construction Information System (DCIS)—for planning, programming, and developing projects. DCIS tracks information by work descriptions, funding requirements, and dates for proposed activities. DCIS provides the source of information on letting for construction bids of the projects described in this annual report.

These databases provide a wealth of information about Texas bridges. In addition, TxDOT continually evaluates bridge information needs and is currently developing new ways to collect and retrieve data.

Chapter 2 – Characteristics of Texas Bridges

Terms. Distinctive characteristics of publicly owned vehicular bridges include the following:

- *On-system or off-system*: On-system bridges are located on the designated state highway system, are administered by TxDOT, and are typically funded with a combination of federal and state or state-only funds. Off-system bridges are not part of the designated state highway system and are under the direct jurisdiction of the local government such as a county, city, other political subdivision of the state, or special district with authority to finance a highway improvement project. This report classifies bridges by their location on- or off-system.
- *Age*: This report classifies bridges by age according to significant historic changes in design criteria governing widths and live loads. Live loads are the moving weights placed on a bridge, not including the weight of the structure itself. In the few cases where accumulated data for a structure does not identify age, this report categorizes the age as "Not Classified."
- *Type*: This report distinguishes between span-type bridges and bridge-class culverts. A *span-type bridge* is a structure erected over a depression or an obstruction (such as water, a highway, or a railway), having a roadway for carrying traffic, and having an opening measured along the centerline of the roadway of more than 20 feet. A *bridge-class culvert* is a structure under the roadway, usually for drainage, with a clear opening of 20 feet or more measured along the centerline of the roadway or between extreme ends of the openings for multiple boxes or multiple pipes that are 60 inches or more in diameter. Bridge-class culverts are usually covered with embankment and are composed of structural material around their entire perimeter. Because of their simplicity of construction, bridge-class culverts are generally more durable than span-type bridges.
- *Main-span material*: This report categorizes bridges by main-span material: reinforced concrete, prestressed concrete, structural steel, and timber. In the few cases where accumulated data for a structure does not identify main-span material, this report categorizes the main-span material as "Other."

On- and Off-system Bridges. Texas has approximately 40% more bridges than any other state. The following figure shows the number of on- and off-system bridges in Texas.

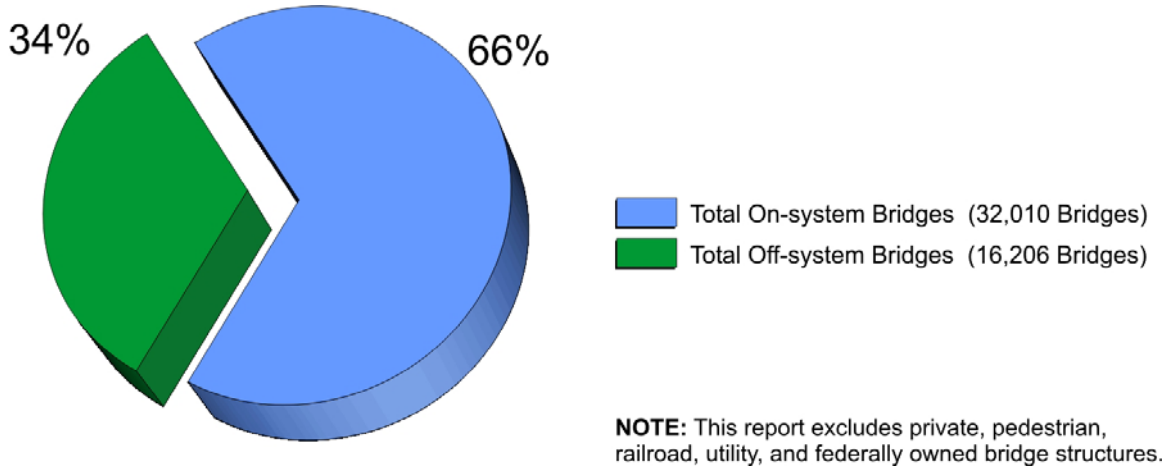


Figure 2-1. Count of On- and Off-system Texas Bridges (48,216 Total)

In September 2002, Texas had 32,010 on-system bridges and 16,206 off-system bridges, a total of 48,216 publicly owned vehicular bridges, 132 more bridges than in September 2001 and 428 more bridges than in September 2000. As shown in the following table, most of the bridges added during FY 2002—77 of them—are on-system bridges.

Table 2-1. Count of On- and Off-system Bridges

	On-system	Off-system	Total
Bridges in Sept. 2002	32,010	16,206	**48,216**
Bridges in Sept. 2001	31,933	16,151	**48,084**
Bridges in Sept. 2000	31,678	16,110	**47,788**
Change during FY 2002	+77	+55	**+132**
Change during FY 2001	+255	+41	**+296**

The following figure shows the number of on-system bridges in TxDOT districts.

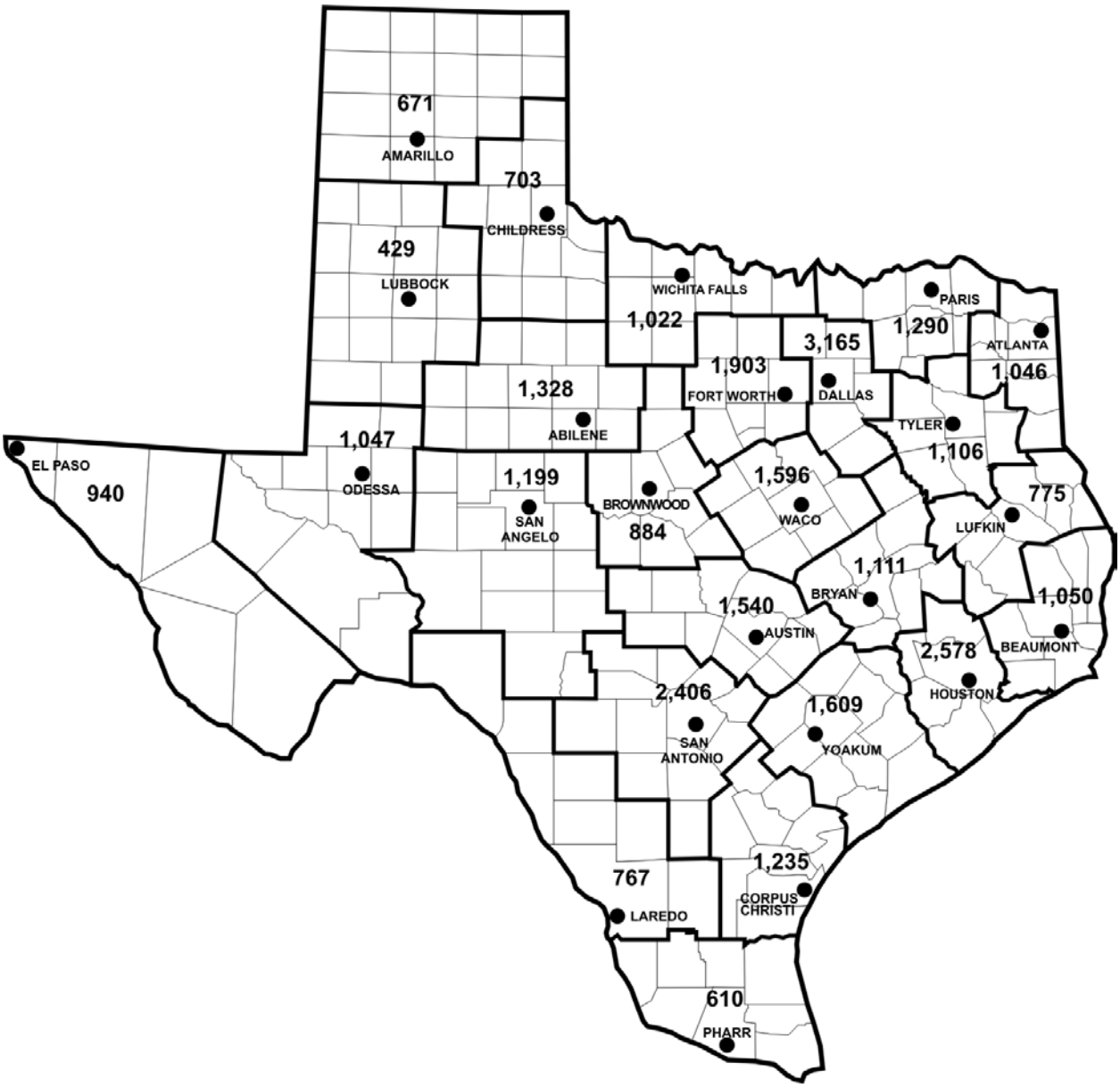


Figure 2-2. Count of On-system Bridges by District (32,010 Total)

Off-system bridges are under the jurisdiction of county, city, or other local governments. See Appendix C for a map of Texas counties by district.

The following figure shows the number of off-system bridges in TxDOT districts.

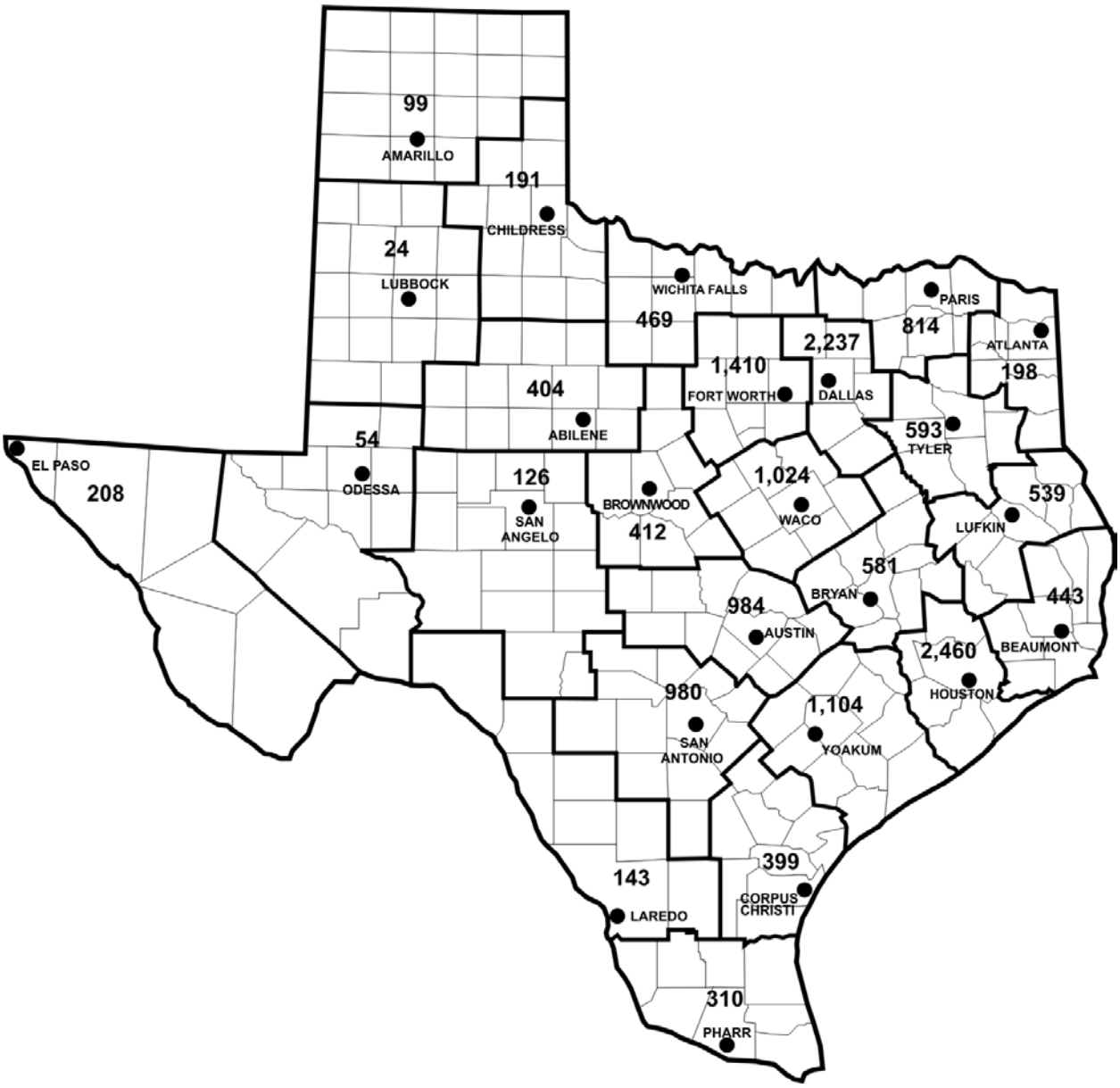


Figure 2-3. Count of Off-system Bridges by District (16,206 Total)

The following figure shows the number of off-system bridges in Texas counties.

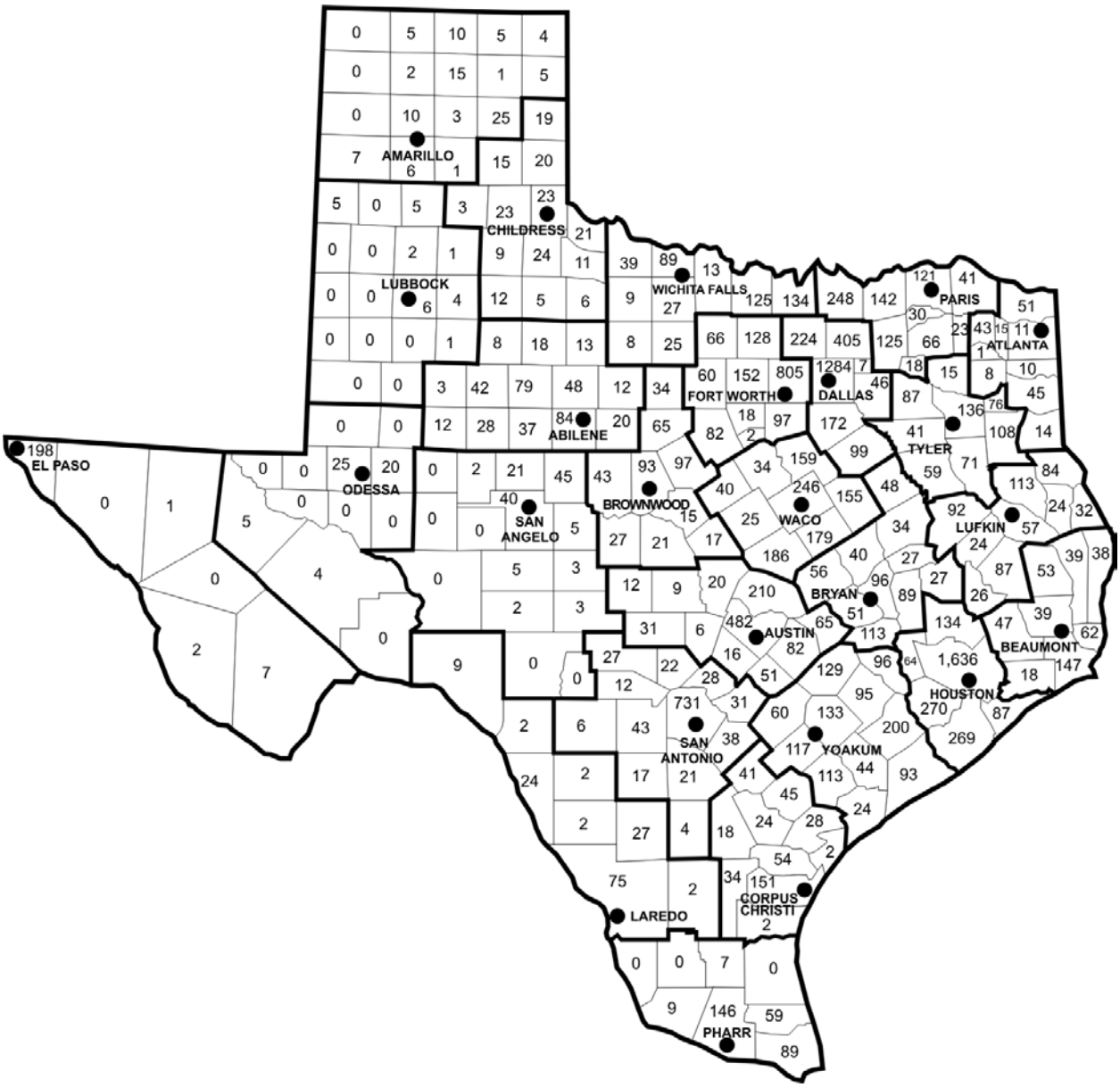


Figure 2-4. Count of Off-system Bridges by County (16,206 Total)

Age. Correlation between the age of bridges and their need for special maintenance predicts the need for resources to support bridge replacement and rehabilitation. In addition, on-system Texas bridges built after 1900 can be classified by significant changes in the design criteria that governed their construction:

- Built before 1950—Bridges generally designed for less than the current state legal load. Many of these bridges are load-posted.
- Built between 1950 and 1970—Bridges generally required to accommodate HS20[2] or higher design live loads but not required to be at least as wide as their approach roadways. (Required bridge load capacity is described in detail in the TxDOT online *Bridge Inspection Manual*.) A number of these bridges are too narrow to meet current requirements.
- Built after 1970—Bridges generally required to accommodate HS20 or above design live load and to be at least as wide as their approach roadways.

Between 1950 and 1970, many new-location bridges were built as the interstate and state highway system expanded. The number of on-system bridges built during this time was more than triple the number of off-system bridges built.

In FY 2002, 77 newly constructed on-system bridges and 55 newly constructed off-system bridges were added to the Texas inventory. In general since 1970, however, the number of off-system bridges has increased at a much faster rate. The on-system transportation infrastructure is well established in contrast to the many new off-system roads and bridges in the increasing number of new subdivisions in urban areas across the state.

The following table and figures show bridges by age groupings.

Table 2-2. Age of Bridges in FY 2002

Age	On-system	Off-system	Total
Built before 1950	7,030	3,103	10,133
Built 1950-1970	14,294	4,071	18,365
Built after 1970	10,668	9,027	19,695
Not classified	18	5	23
Total	**32,010**	**16,206**	**48,216**

[2] HS20 is the minimum design load recommended by the American Association of State Highway and Transportation Officials (AASHTO) for bridges on interstate highways. This loading is based on a hypothetical vehicle with one 8,000-lb. axle and two 32,000-lb. axles.

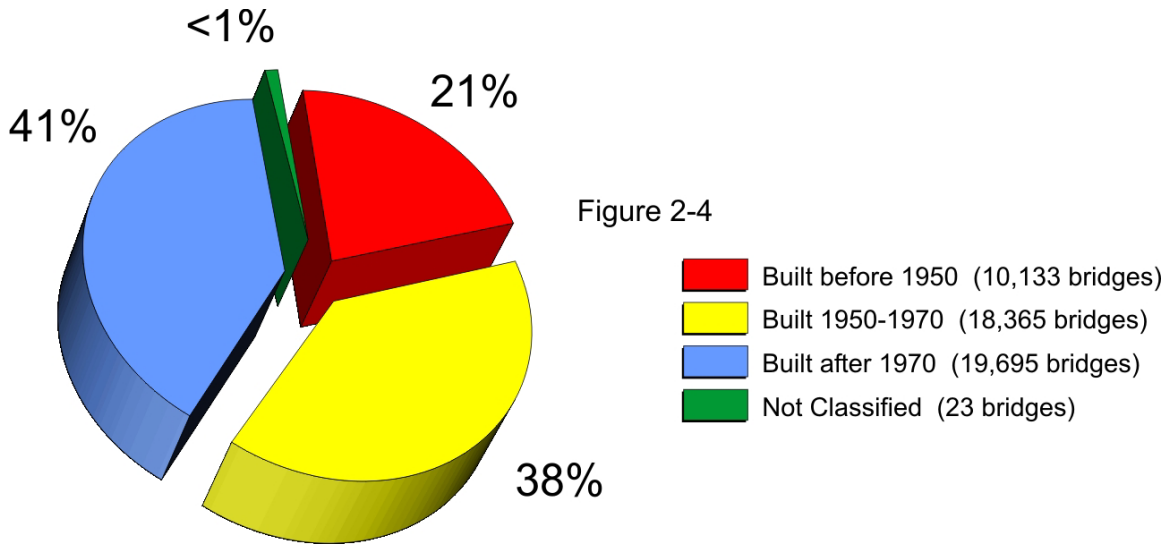


Figure 2-5. Age of On- and Off-system Texas Bridges

Over 59% of Texas bridges have been in service for more than 30 years. The average age of all on-system bridges is 39 years, and the average age of all off-system bridges is 32 years. The median age of all on-system bridges is 39 years, and the median age of all off-system bridges is 27 years.

The average age of on-system span-type bridges is 35 years, and the average age of off-system span-type bridges is 32 years. The median age of on-system span-type bridges is 35 years, and the median age of off-system span-type bridges is 27 years.

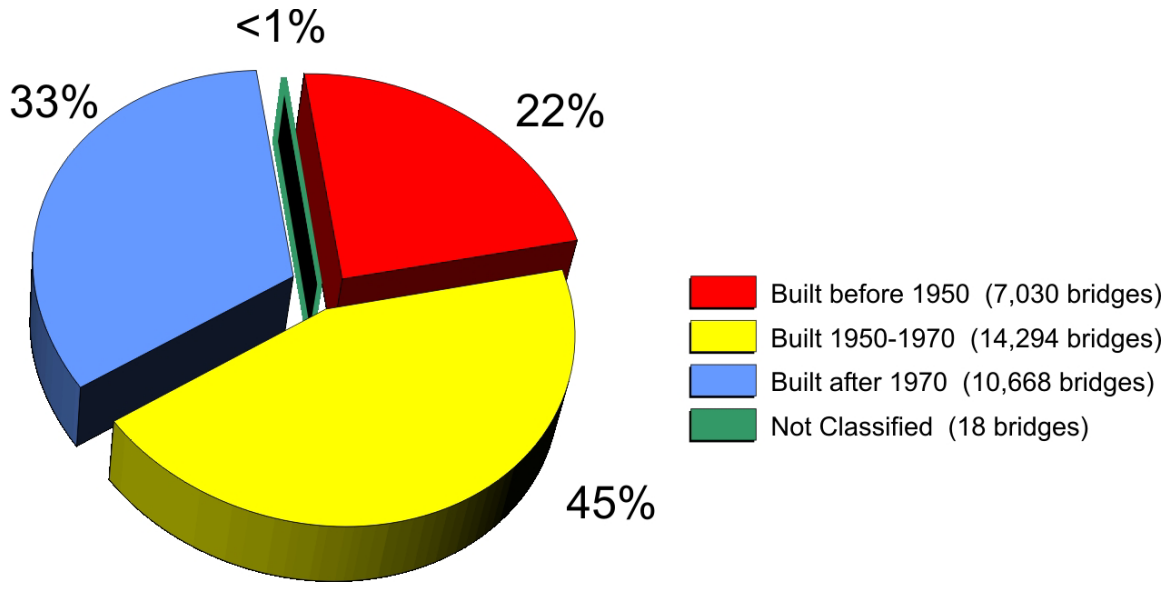


Figure 2-6. Age of On-system Bridges

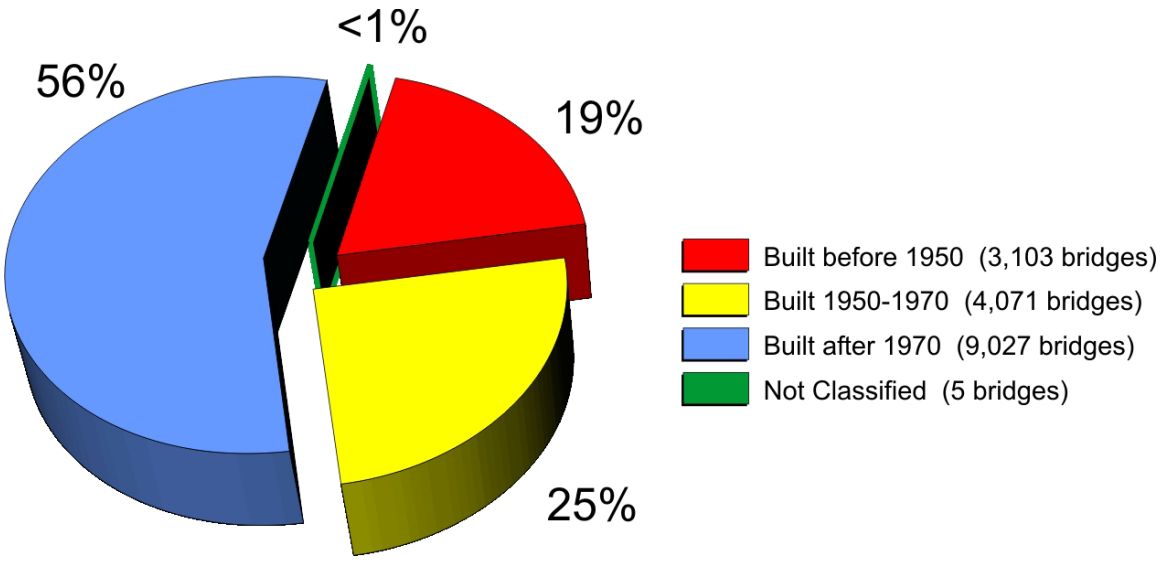


Figure 2-7. Age of Off-system Bridges

In September 2002, 33.3% of on-system bridges (up from 32.5% in September 2001) and 55.7% of off-system bridges (up from 52.7% in September 2001) had been built after 1970. The following table shows change in the age of Texas bridges during FY 2002.

Table 2-3. Change in Age of Bridges from September 2001 to September 2002

Age	As of Sept. 2001	As of Sept. 2002	Change
On-system Bridges			
▪ Built before 1950	7,113	7,030	–83
▪ Built 1950-1970	14,380	14,294	–86
▪ Built after 1970	10,382	10,668	+286
▪ Not classified	58	18	–40
Off-system Bridges			
▪ Built before 1950	3,314	3,103	–211
▪ Built 1950-1970	4,287	4,071	–216
▪ Built after 1970	8,518	9,027	+509
▪ Not classified	32	5	–27

Type. The following table shows the number of span-type bridges and bridge-class culverts in Texas. Nearly 36% of Texas bridges are bridge-class culverts: 41% of on-system bridges and 26% of off-system bridges.

Table 2-4. Type of Bridges in FY 2002

Type	On-system	Off-system	Total
Bridges (span-type):	**18,946**	**11,972**	**30,918**
▪ Built before 1950	2,933	2,414	
▪ Built 1950-1970	8,285	2,957	
▪ Built after 1970	7,713	6,598	
▪ Not classified	15	3	
Culverts (bridge-class):	**13,064**	**4,234**	**17,298**
▪ Built before 1950	4,097	689	
▪ Built 1950-1970	6,009	1,114	
▪ Built after 1970	2,955	2,429	
▪ Not classified	3	2	
Total	**32,010**	**16,206**	**48,216**

Main-span Superstructure Material. The following table shows Texas bridges by type, age, and main-span material.

Table 2-5. Main-span Material for Bridges in FY 2002

Primary Material	On-system		Off-system		Total
	Bridge (Span-type)	Culvert (Bridge-class)[1]	Bridge (Span-type)	Culvert (Bridge-class)*	
Reinforced concrete:	**8,219**	**12,969**	**2,999**	**4,005**	**28,192**
▪ Built before 1950	2,106	4,051	711	594	
▪ Built 1950-1970	4,647	6,001	1,091	1,090	
▪ Built after 1970	1,463	2,914	1,197	2,319	
▪ Not classified	3	3	0	2	
Prestressed concrete:	**7,597**	**NA**	**2,757**	**NA**	**10,354**
▪ Built before 1950	61	NA	33	NA	
▪ Built 1950-1970	1,835	NA	358	NA	
▪ Built after 1970	5,690	NA	2,364	NA	
▪ Not classified	11	NA	2	NA	
Steel:	**3,041**	**34**	**3,976**	**144**	**7,195**
▪ Built before 1950	709	5	928	22	
▪ Built 1950-1970	1,780	2	904	20	
▪ Built after 1970	551	27	2,144	102	
▪ Not classified	1	0	0	0	
Timber:	**22**	**0**	**1,750**	**0**	**1,772**
▪ Built before 1950	14	0	318	0	
▪ Built 1950-1970	8	0	558	0	
▪ Built after 1970	0	0	873	0	
▪ Not classified	0	0	1	0	
Other:	**67**	**61**	**490**	**85**	**703**
▪ Built before 1950	43	41	424	73	
▪ Built 1950-1970	15	6	46	4	
▪ Built after 1970	9	14	20	8	
▪ Not classified	0	0	0	0	
Total	**18,946**	**13,064**	**11,972**	**4,234**	**48,216**

***** Numbers for reinforced concrete bridge-class culverts include both reinforced and prestressed concrete.

Most on-system span-type bridges built between 1950 and 1970 have reinforced concrete main spans. Very few on-system span-type bridges have timber superstructures. Off-system span-type bridges built during the same period are likely to have either structural steel or reinforced concrete main spans. However, a number of off-system span-type bridges from all three age groups—more than 14%—use timber. Timber and steel are popular with off-system bridge owners because of the following reasons:

- Steel and timber bridges are easier to construct in pieces and usually do not require specialized equipment to haul and erect.
- Recycled steel and timber are often incorporated into off-system bridges, reducing the initial cost of the bridge.
- Recycled railroad flat cars and barrels from railroad tank cars have been available for use in off-system bridges. Their high load capacity and relatively low cost make them attractive to local governments as bridge material. However, these structures have inherent geometric

deficiencies, approved traffic railing is difficult if not impossible to install, and their use can limit hydraulic capacity.

During FY 2002, the number of on-system timber bridges decreased by one and the number of off-system timber bridges decreased by 179.

Most on-system bridges built since 1970 have prestressed concrete main spans. Off-system bridges built during this period generally have prestressed concrete, structural steel, or reinforced concrete main spans. Although the proportion of timber bridges is decreasing, a number of off-system bridges built by local governments since 1970 are timber.

On-system Span-type Timber Bridges. Timber is sometimes used for bridge main spans, approach spans, and piling; however, it is not as durable as other bridge materials and it can deteriorate at a faster rate. In addition, piling length is restricted for timber substructures. TxDOT has not designed on-system timber substructure bridges for more than 50 years, and as a result, on-system timber substructure bridges are reaching the end of their service life. For these reasons, TxDOT has begun targetting on-system bridges with timber substructures for replacement by bridges with more durable substructure materials.

In September 2001, Texas had of total of 279 span-type bridges with timber main spans, approach spans, and piling, and in September 2002, Texas had 11 fewer, as shown in the following table.

Table 2-6. On-system Span-type Timber Bridges* by District

District	FY 2001 Bridge Count	FY 2002 Bridge Count
Abilene	0	0
Amarillo	21	20
Atlanta	40	37
Austin	8	8
Beaumont	18	18
Brownwood	1	1
Bryan	11	11
Childress	4	4
Corpus Christi	32	32
Dallas	34	29
El Paso	0	0
Fort Worth	7	7
Houston	5	5
Laredo	1	1
Lubbock	2	2
Lufkin	50	50
Odessa	1	1
Paris	7	6
Pharr	3	3
San Angelo	0	0
San Antonio	4	4
Tyler	2	2
Waco	5	5
Wichita Falls	1	0
Yoakum	22	22
Total	**279**	**268**

***** The *Report on Texas Bridges as of September 2001* did not include bridges with timber approach spans or timber piling under pile caps. Figures in this table have been updated to reflect these expanded categories of timber bridges, as identified by TxDOT safety inspectors.

Chapter 3 – Condition of Texas Bridges

Terms. This report characterizes the condition of bridges as follows:

- *Sufficient structure:* A sufficient structure meets current federal and Texas requirements; it is not structurally deficient, functionally obsolete, or sub-standard for load only. Desirable change in sufficient structures from year to year is reflected by positive numbers, showing an increase in sufficient structures.
- *Non-sufficient structure:* A non-sufficient structure is structurally deficient, functionally obsolete, or sub-standard for load only. Desirable change in non-sufficient structures from year to year is reflected by negative numbers, showing a decrease in non-sufficient structures.
- *Structurally deficient structure:* A bridge or bridge-class culvert is classified by the Federal Highway Administration (FHWA) as structurally deficient if it meets any of the following criteria:
  - It has an extreme restriction on its load-carrying capacity.
  - It has deterioration severe enough to reduce its load-carrying capacity beneath its original as-built capacity.
  - It is closed.
  - It is frequently over-topped during flooding, creating severe traffic delays.
- *Functionally obsolete structure:* A bridge is classified by the FHWA as functionally obsolete if it fails to meet its design criteria in any one of the following areas:
  - Deck geometry
  - Load-carrying capacity
  - Vertical or horizontal clearances
  - Approach roadway alignment

  In this report, structures that are both functionally obsolete and structurally deficient are counted only as structurally deficient.
- *Sub-standard-for-load-only structure:* A bridge is considered sub-standard for load only if it is not classified as structurally deficient or functionally obsolete but has a load capacity less than the maximum load permitted by state law. It has not deteriorated or has not deteriorated severely enough to reduce its load capacity beneath its original as-built capacity, but its original as-built capacity was not designed to carry current safe legal loads. A sub-standard-for-load-only structure is load-posted or recommended for load posting.
- *Load-posted bridge:* A bridge that is load-posted has a safe load capacity less than the state legal load, and its load capacity is communicated by signs at the bridge site. (Note. Certain vehicles, identified in Chapter 622 of the Texas Transportation Code, that exceed posted load capacity can legally use load-posted bridges.)
- *Land-locking bridges:* This report classifies a bridge as land-locking if it restricts traffic into an area because of load limitations or closures. These bridges are load-posted.

Categories of bridge conditions overlap. For example, a bridge that is structurally deficient is not necessarily load-posted, and a bridge that is load-posted is not necessarily classified as structurally deficient. The following figure shows conceptual overlap of the categories.

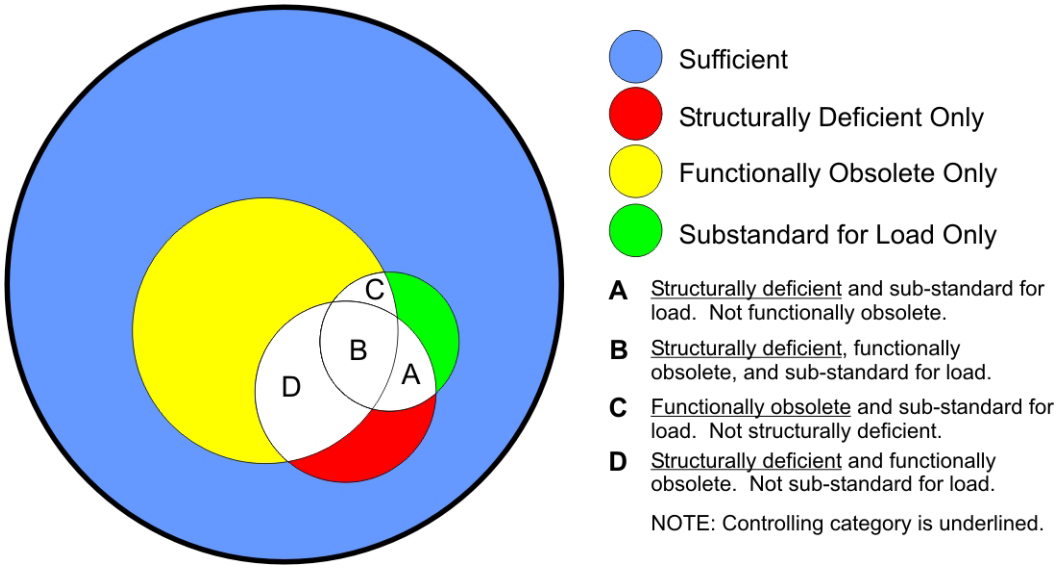


Figure 3-1. Categories of Bridge Conditions

This report identifies structurally deficient bridges by number of bridges and by square footage of bridge deck area. Square footage of deck area is provided because bridges exist in a variety of sizes and bridge replacement cost is proportional to deck area.

Bridge Safety Inspections. TxDOT inspects on- and off-system bridges on a periodic schedule, collecting information about bridge conditions and recording it in a state-maintained database. Regularly scheduled TxDOT safety inspections include the following (the safety inspection process is described in detail in the TxDOT online *Bridge Inspection Manual*):

- Routine inspections—At least once every two years a routine inspection is conducted on each Texas publicly owned vehicular on- and off-system span-type bridge more than 20 feet long and on most bridge-class culverts. (A bridge-class culvert that is less than 50 years old, experiences limited average daily traffic, and is in good condition may qualify for a 4-year routine inspection cycle.) In routine inspections, inspectors record evidence and degree of deterioration and scour, among other characteristics of bridge condition.
- Fracture-critical inspections—In addition to the routine inspection, at least once every five years an in-depth inspection is conducted of fracture-critical members (steel, tensioned bridge components whose failure will result in the collapse of the bridge) on all Texas on- and off-system publicly owned vehicular bridges.
- Underwater inspections—In addition to the routine inspection, at least once every five years an in-depth underwater inspection is conducted on each on- and off-system publicly owned vehicular bridge and bridge-class culvert that has substructure elements underwater year-round.

The federally mandated bridge safety inspection program is administered by the Bridge Division.

TxDOT conducted a total of 23,089 bridge safety inspections in FY 2001 and 23,509 bridge safety inspections in FY 2002. The following table shows on- and off-system bridge safety inspections conducted in FY 2002 by TxDOT district.

Table 3-1. Bridge Safety Inspections Conducted in FY 2002 by District

District	On-system Bridges			Off-system Bridges		
	Routine Inspection	Fracture-Critical	Underwater	Routine Inspection	Fracture-Critical	Underwater
Abilene	5	0	2	391	3	0
Amarillo	321	0	0	48	0	0
Atlanta	631	0	5	201	0	1
Austin	510	7	2	982	12	0
Beaumont	195	6	7	275	1	2
Brownwood	884	1	9	9	0	0
Bryan	1	0	9	536	0	3
Childress	552	0	0	0	0	0
Corpus Christi	1,232	0	0	0	0	3
Dallas	3,071	15	0	1,304	3	1
El Paso	1	12	0	0	1	
Fort Worth	519	5	6	1,089	61	13
Houston	1	10	30	2,458	1	9
Laredo	0	2	0	0	0	0
Lubbock	251	0	0	18	0	0
Lufkin	765	2	7	4	0	2
Odessa	374	0	0	54	0	0
Paris	79	2	3	802	4	1
Pharr	3	1	1	8	0	2
San Angelo	874	1	1	31	1	0
San Antonio	0	1	0	977	7	0
Tyler	2	1	2	558	0	0
Waco	179	1	1	947	17	0
Wichita Falls	933	0	0	2	0	0
Yoakum	158	0	39	920	14	1
Total	**11,541**	**67**	**124**	**11,614**	**125**	**38**

Structurally Deficient Bridges. In September 2002, a total of 2,928 of the state's 48,216 bridges were structurally deficient: 622 on-system span-type bridges, 71 on-system culverts, 2,161 off-system span-type bridges, and 74 off-system culverts as shown in Figure 3-2 and Table 3-7. Most of the structurally deficient bridges were off-system span-type bridges.

Overall, the total number of structurally deficient on-system bridges was 758 in September 2000 (680 span-type bridges and 78 bridge-class culverts), 763 in September 2001 (685 span-type bridges and 78 bridge-class culverts), and 693 in September 2002 (622 span-type bridges and 71 bridge-class culverts). The number of structurally deficient on-system bridges increased by 5 during FY 2001 (all on-system span-type bridges), but it decreased by 70 during FY 2002 (63 span-type bridges and 7 bridge-class culverts).

The total number of structurally deficient off-system bridges was 2,636 in September 2000 (2,566 span-type bridges and 70 bridge-class culverts), 2,433 in September 2001 (2,371 span-type bridges and 62 bridge-class culverts), and 2,235 in September 2002 (2,161 span-type bridges and 74 bridge-class culverts). The number of structurally deficient off-system bridges decreased by 203 during FY 2001 (195 span-type bridges and 8 bridge-class culverts), and it decreased by 198 during FY 2002 (210 fewer span-type bridges but 12 additional bridge-class culverts).

Functionally Obsolete Bridges. In September 2002, a total of 9,392 of the state's 48,216 bridges were functionally obsolete: 4,317 on-system span-type bridges, 628 on-system culverts, 3,883 off-system span-type bridges, and 564 off-system culverts as shown in Figure 3-2 and Table 3-7. Most of the functionally obsolete bridges were on-system span-type bridges, followed closely by off-system span-type bridges.

Overall, the total number of functionally obsolete on-system bridges was 4,731 in September 2000 (4,153 span-type bridges and 578 bridge-class culverts), 4,751 in September 2001 (4,183 span-type bridges and 568 bridge-class culverts), and 4,945 in September 2002 (4,317 span-type bridges and 628 bridge-class culverts). The number of functionally obsolete on-system bridges increased by 20 during FY 2001 (30 more span-type bridges but 10 fewer bridge-class culverts), and it increased by 194 during FY 2002 (134 span-type bridges and 60 bridge-class culverts).

The total number of functionally obsolete off-system bridges was 4,314 in September 2000 (3,753 span-type bridges and 561 bridge-class culverts), 4,455 in September 2001 (3,844 span-type bridges and 611 bridge-class culverts), and 4,447 in September 2002 (3,883 span-type bridges and 564 bridge-class culverts). The number of functionally obsolete off-system bridges increased by 141 during FY 2001 (91 span-type bridges and 50 bridge-class culverts), but it decreased by 8 during FY 2002 (39 more span-type bridges but 47 fewer bridge-class culverts).

Sub-standard for Load Only (Load-posted). In September 2002, a total of 1,654 of Texas' 48,216 bridges were classified sub-standard for load only: 190 on-system span-type bridges, 13 on-system culverts, 1,400 off-system span-type bridges, and 51 off-system culverts, as shown in Figure 3-2 and Table 3-7. Most of the sub-standard-for-load-only bridges were off-system span-type bridges.

Overall, the total number of sub-standard-for-load-only on-system bridges was 327 in September 2000 (293 span-type bridges and 34 bridge-class culverts), 272 in September 2001 (237 span-type bridges and 35 bridge-class culverts), and 203 in September 2002 (190 span-type bridges and 13 bridge-class culverts). The number of sub-standard-for-load-only on-system bridges decreased by 55 during FY 2001 (56 fewer span-type bridges but 1 more bridge-class culvert), and it decreased by 69 during FY 2002 (47 span-type bridges and 22 bridge-class culverts).

The total number of sub-standard-for-load-only off-system bridges was 1,489 in September 2000 (1,438 span-type bridges and 51 bridge-class culverts), 1,518 in September 2001 (1,465 span-type bridges and 53 bridge-class culverts), and 1,451 in September 2002 (1,400 span-type bridges and 51 bridge-class culverts). The number of sub-standard-for-load-only off-system

bridges increased by 29 during FY 2001 (27 span-type bridges and 2 bridge-class culverts), but it decreased by 67 during FY 2002 (65 fewer span-type bridges and 2 fewer bridge-class culverts).

Condition of Bridges. The following figures show the condition of Texas bridges as of September 2002.

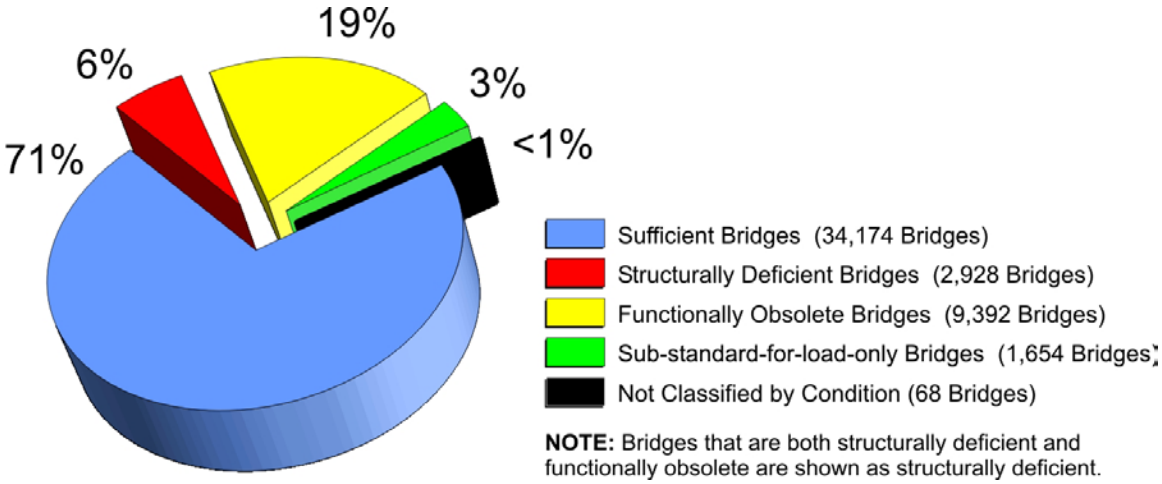


Figure 3-2. Condition of Texas Bridges by Count in September 2002 (48,216 Bridges Total)

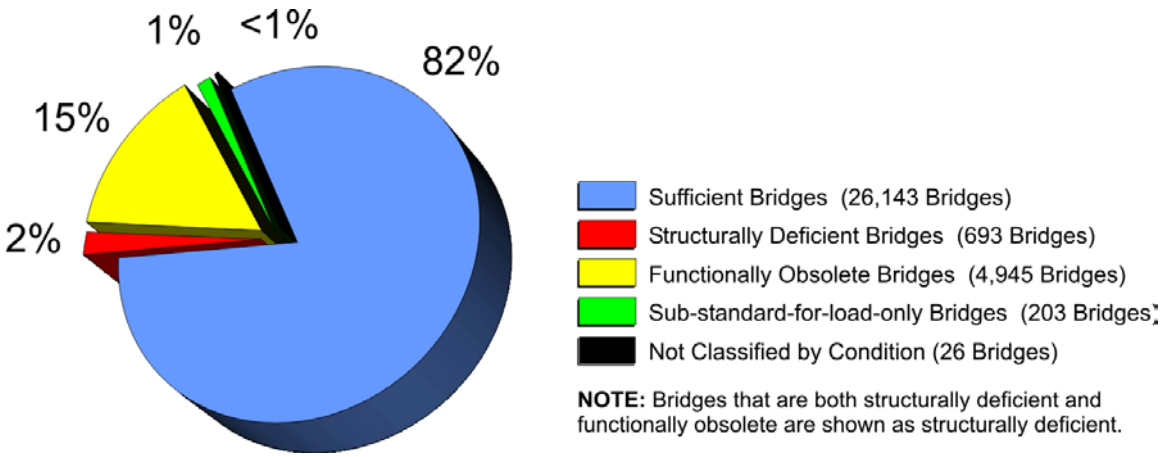


Figure 3-3. Condition of On-system Bridges by Count in September 2002 (32,010 Bridges Total)

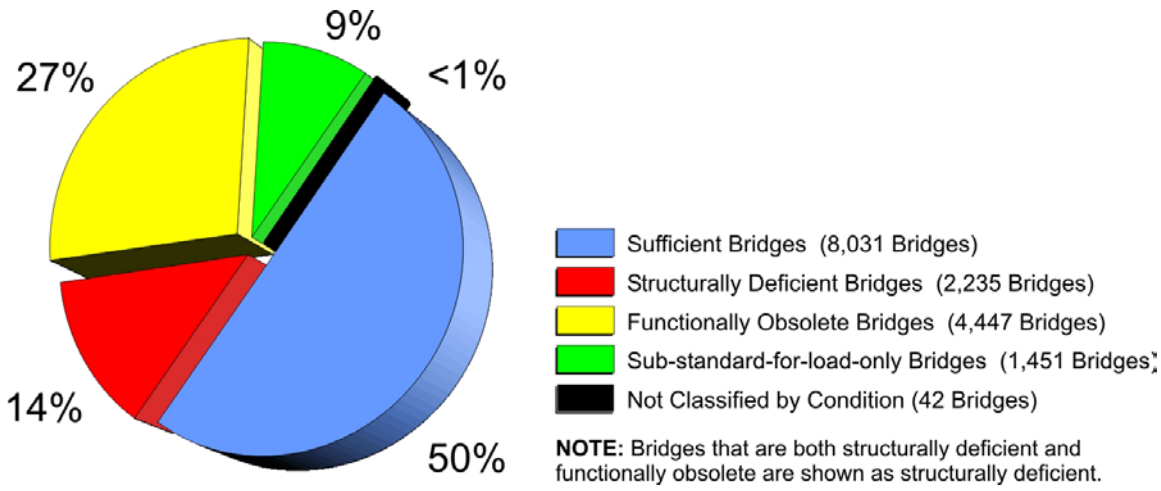


Figure 3-4. Condition of Off-system Bridges by Count in September 2002 (16,206 Bridges Total)

The following table shows the condition of on-system Texas span-type bridges in September 2001 and September 2002.

Table 3-2. Condition of On-system Span-type Bridges by Count

Main-span Material	Total Bridges		Sufficient Bridges		Non-sufficient Bridges						Not Classified by Condition	
					Structurally Deficient		Functionally Obsolete		Sub-standard-for-Load-Only			
	2001	2002	2001	2002	2001	2002	2001	2002	2001	2002	2001	2002
Reinforced concrete:	**8,305**	**8,219**	**6,198**	**6,091**	**395**	**352**	**1,538**	**1,627**	**170**	**146**	**4**	**3**
▪ Built before 1950	2,153	2,106	1,578	1,552	143	129	378	385	54	39	0	1
▪ Built 1950-1970	4,687	4,647	3,257	3,170	249	222	1,063	1,147	115	106	3	2
▪ Built after 1970	1,463	1,463	1,361	1,366	3	1	97	95	1	1	1	0
▪ Not classified	2	3	2	3	0	0	0	0	0	0	0	0
Prestressed concrete:	**7,437**	**7,597**	**5,825**	**5,960**	**46**	**50**	**1,542**	**1,579**	**5**	**2**	**19**	**6**
▪ Built before 1950	68	61	58	55	4	1	6	5	0	0	0	0
▪ Built 1950-1970	1,845	1,835	1,193	1,182	28	31	622	619	1	2	1	1
▪ Built after 1970	5,494	5,690	4,550	4,714	14	18	909	953	4	0	17	5
▪ Not classified	30	11	24	9	0	0	5	2	0	0	1	0
Steel:	**3,055**	**3,041**	**1,703**	**1,718**	**216**	**202**	**1,072**	**1,076**	**60**	**38**	**4**	**7**
▪ Built before 1950	722	709	424	419	92	81	172	181	31	23	3	5
▪ Built 1950-1970	1,802	1,780	948	946	123	121	704	697	27	15	0	1
▪ Built after 1970	527	551	330	352	1	0	193	198	2	0	1	1
▪ Not classified	4	1	1	1	0	0	3	0	0	0	0	0
Timber:	**23**	**22**	**7**	**8**	**11**	**4**	**4**	**7**	**1**	**3**	**0**	**0**
▪ Built before 1950	15	14	4	4	7	3	3	4	1	3	0	0
▪ Built 1950-1970	8	8	3	4	4	1	1	3	0	0	0	0
▪ Built after 1970	0	0	0	0	0	0	0	0	0	0	0	0
Other:	**70**	**67**	**23**	**22**	**17**	**14**	**27**	**28**	**1**	**1**	**2**	**2**
▪ Built before 1950	46	43	11	11	11	8	23	23	1	1	0	0
▪ Built 1950-1970	15	15	5	4	6	6	4	5	0	0	0	0
▪ Built after 1970	9	9	7	7	0	0	0	0	0	0	2	2
▪ Not classified	0	0	0	0	0	0	0	0	0	0	0	0
Total	**18,890**	**18,946**	**13,756**	**13,799**	**685**	**622**	**4,183**	**4,317**	**237**	**190**	**29**	**18**

The following table shows the condition of on-system Texas bridge-class culverts in September 2001 and September 2002.

Table 3-3. Condition of On-System Bridge-class Culverts by Count

Main-span Material	Total Culverts		Sufficient Culverts		Non-sufficient Culverts						Not Classified by Condition	
					Structurally Deficient		Functionally Obsolete		Sub-standard-for-Load-Only			
	2001	2002	2001	2002	2001	2002	2001	2002	2001	2002	2001	2002
Concrete:	**12,672**	**12,969**	**11,997**	**12,256**	**74**	**68**	**557**	**625**	**32**	**12**	**12**	**8**
▪ Built before 1950	4,054	4,051	3,819	3,817	30	28	187	197	17	9	1	0
▪ Built 1950-1970	6,009	6,001	5,664	5,631	35	29	289	332	15	3	6	6
▪ Built after 1970	2,598	2,914	2,505	2,805	9	11	80	96	0	0	4	2
▪ Not classified	11	3	9	3	0	0	1	0	0	0	1	0
Steel:	**0**	**34**	**0**	**31**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**
• Built before 1950	0	5	0	4	0	0	0	1	0	0	0	0
• Built 1950-1970	0	2	0	1	0	0	0	1	0	0	0	0
• Built after 1970	0	27	0	26	0	0	0	1	0	0	0	0
• Not classified	0	0	0	0	0	0	0	0	0	0	0	0
Other:	**371**	**61**	**353**	**57**	**4**	**3**	**11**	**0**	**3**	**1**	**0**	**0**
▪ Built before 1950	55	41	47	37	3	3	3	0	2	1	0	0
▪ Built 1950-1970	14	6	11	6	1	0	2	0	0	0	0	0
▪ Built after 1970	291	14	284	14	0	0	6	0	1	0	0	0
▪ Not classified	11	0	11	0	0	0	0	0	0	0	0	0
Total	**13,043**	**13,064**	**12,350**	**12,344**	**78**	**71**	**568**	**628**	**35**	**13**	**12**	**8**

The following table shows the condition of off-system Texas span-type bridges in September 2001 and September 2002.

Table 3-4. Condition of Off-System Span-type Bridges by Count

Main-span Material	Total Bridges		Sufficient Bridges		Non-sufficient Bridges						Not Classified by Condition	
					Structurally Deficient		Functionally Obsolete		Sub-standard-for-Load-Only			
	2001	2002	2001	2002	2001	2002	2001	2002	2001	2002	2001	2002
Reinforced concrete:	**2,980**	**2,999**	**1,691**	**1,693**	**167**	**160**	**949**	**969**	**171**	**175**	**2**	**2**
▪ Built before 1950	714	711	309	301	84	80	260	265	61	65	0	0
▪ Built 1950-1970	1,109	1,091	530	508	72	69	418	427	89	86	0	1
▪ Built after 1970	1,155	1,197	852	884	10	11	271	277	21	24	1	1
▪ Not classified	2	0	0	0	1	0	0	0	0	0	1	1
Prestressed concrete:	**2,608**	**2,757**	**1,393**	**1,491**	**22**	**23**	**1,103**	**1,150**	**84**	**86**	**6**	**7**
▪ Built before 1950	32	33	26	24	0	1	6	8	0	0	0	0
▪ Built 1950-1970	365	358	181	177	11	10	151	147	22	24	0	0
▪ Built after 1970	2,208	2,364	1,184	1,288	11	12	945	995	62	62	6	7
▪ Not classified	3	2	2	2	0	0	1	0	0	0	0	0
Steel:	**3,949**	**3,976**	**1,010**	**1,090**	**1,002**	**962**	**1,310**	**1,324**	**623**	**595**	**4**	**5**
▪ Built before 1950	1,005	928	108	107	432	394	289	265	175	161	1	1
▪ Built 1950-1970	1,002	904	196	171	298	269	359	325	148	138	1	1
▪ Built after 1970	1,924	2,144	699	812	266	299	658	734	299	296	2	3
▪ Not classified	18	0	7	0	6	0	4	0	1	0	0	0
Timber:	**1,929**	**1,750**	**208**	**198**	**702**	**619**	**443**	**400**	**568**	**525**	**8**	**8**
▪ Built before 1950	374	318	10	8	213	173	60	58	89	76	2	3
▪ Built 1950-1970	632	558	29	24	285	254	145	121	171	157	2	2
▪ Built after 1970	918	873	169	166	200	191	237	221	308	292	4	3
▪ Not classified	5	1	0	0	4	1	1	0	0	0	0	0
Other:	**570**	**490**	**22**	**19**	**478**	**397**	**39**	**40**	**19**	**19**	**12**	**15**
▪ Built before 1950	490	424	10	10	422	354	30	31	16	14	12	15
▪ Built 1950-1970	56	46	5	3	44	34	6	6	1	3	0	0
▪ Built after 1970	23	20	7	6	11	9	3	3	2	2	0	0
▪ Not classified	1	0	0	0	1	0	0	0	0	0	0	0
Total	**12,036**	**11,972**	**4,324**	**4,491**	**2,371**	**2,161**	**3,844**	**3,883**	**1,465**	**1,400**	**32**	**37**

The following table shows the condition of off-system Texas bridge-class culverts in September 2001 and September 2002.

Table 3-5. Condition of Off-System Bridge-class Culverts by Count

Main-span Material	Total Culverts		Sufficient Culverts		Non-sufficient Culverts						Not Classified by Condition	
					Structurally Deficient Culverts		Functionally Obsolete Culverts		Sub-standard-for Load-Only Culverts			
	2001	2002	2001	2002	2001	2002	2001	2002	2001	2002	2001	2002
Concrete:	**3,681**	**4,005**	**2,995**	**3,344**	**52**	**56**	**574**	**551**	**52**	**51**	**8**	**3**
▪ Built before 1950	605	594	394	389	34	28	145	146	31	30	1	1
▪ Built 1950-1970	1,089	1,090	884	894	13	15	170	162	17	17	5	2
▪ Built after 1970	1,984	2,319	1,715	2,059	5	13	259	243	4	4	1	0
▪ Not classified	3	2	2	2	0	0	0	0	0	0	1	0
Steel:	**0**	**144**	**0**	**125**	**0**	**11**	**0**	**7**	**0**	**0**	**0**	**1**
▪ Built before 1950	0	22	0	13	0	7	0	2	0	0	0	0
▪ Built 1950-1970	0	20	0	15	0	2	0	3	0	0	0	0
▪ Built after 1970	0	102	0	97	0	2	0	2	0	0	0	1
▪ Not classified	0	0	0	0	0	0	0	0	0	0	0	0
Timber:	**2**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
▪ Built after 1970	2	0	2	0	0	0	0	0	0	0	0	0
Other:	**432**	**85**	**382**	**71**	**10**	**7**	**37**	**6**	**1**	**0**	**2**	**1**
▪ Built before 1950	94	73	77	60	8	7	8	5	0	0	1	0
▪ Built 1950-1970	34	4	23	4	2	0	8	0	1	0	0	0
▪ Built after 1970	304	8	282	7	0	0	21	1	0	0	1	1
Total	**4,113**	**4,234**	**3,377**	**3,540**	**62**	**74**	**611**	**564**	**53**	**51**	**10**	**5**

Change in Condition of Bridges during FY 2002. As shown in the following table, during FY 2002 the number of sufficient bridges increased by 367—37 additional sufficient on-system bridges and 330 additional sufficient off-system bridges.

Table 3-6. Change in Condition of Sufficient Bridges by Count

Condition	September 2000	September 2001	September 2002	Change 2000 to 2001	Change 2001 to 2002
Sufficient On-system Span Bridges	13,543	13,756	13,799	+ 213	+43
Sufficient On-system Bridge-class Culverts	12,257	12,350	12,344	+ 93	–6
Sufficient Off-system Span Bridges	4,283	4,324	4,491	+ 41	+167
Sufficient Off-system Bridge-class Culverts	3,321	3,377	3,540	+ 56	+163
All Sufficient Bridges	**33,404**	**33,807**	**34,174**	**+ 403**	**+367**
Note. In September 2001, bridge records included 83 bridges not classified by condition. In September 2002, bridge records included 68 bridges not classified by condition.					

The number of sufficient bridges increased in FY 2002 by 365; however, 132 of those were new-location bridges, that is, bridges that did not exist before September 2001[3].

During FY 2002, the number of non-sufficient bridges decreased by a total of 218—the total included 55 more non-sufficient on-system bridges and 273 fewer non-sufficient off-system

[3] New-location bridges are added to the inspection database after their post-construction inspection; letting for the construction of bridges added to the inspection database may have occurred in previous years.

bridges. The following figures summarize change in the condition of non-sufficient Texas bridges from September 2000 to September 2002.

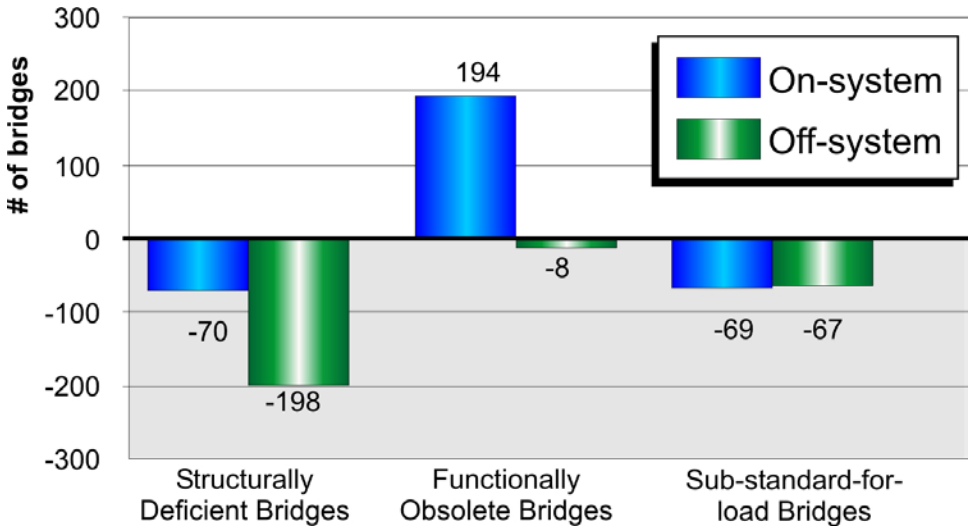


Figure 3-5. Change in Condition of Non-sufficient Bridges during FY 2002

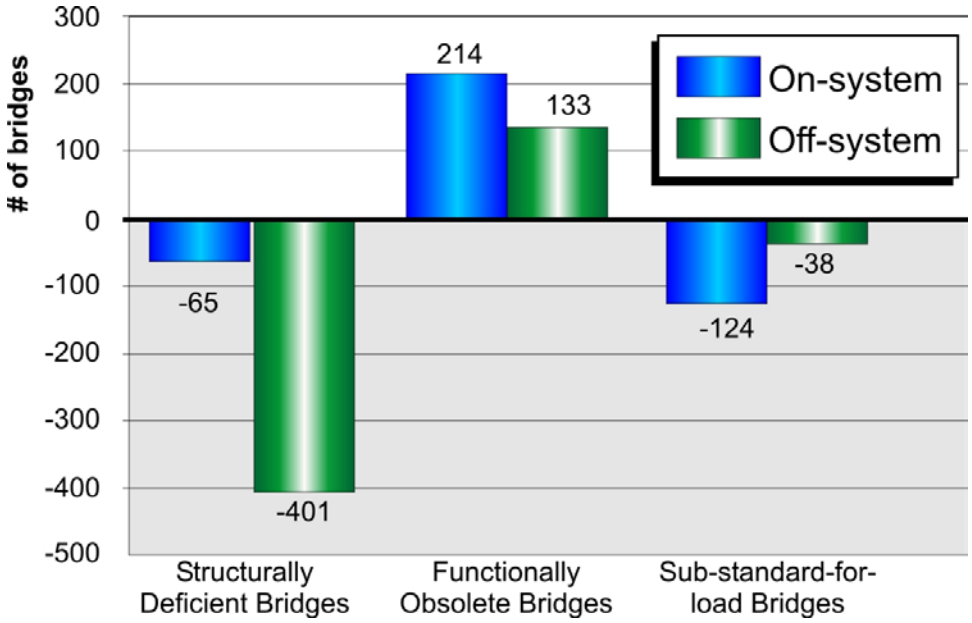


Figure 3-6. Change in Condition of Non-sufficient Bridges between September 2000 and September 2002

The following table shows in more detail the change in condition of non-sufficient bridges from September 2000 to September 2002.

Table 3-7. Change in Condition of Non-sufficient Bridges by Count

Condition		September 2000	September 2001	September 2002	Change 2000 to 2001	Change 2001 to 2002
On-system Span-type Bridges	Structurally Deficient	680	685	622	+ 5	–63
	Functionally Obsolete	4,153	4,183	4,317	+ 30	+134
	Sub-standard for Load Only	293	237	190	– 56	–47
On-system Bridge-class Culverts	Structurally Deficient	78	78	71	0	–7
	Functionally Obsolete	578	568	628	– 10	+60
	Sub-standard for Load Only	34	35	13	+ 1	–22
Off-system Span-type Bridges	Structurally Deficient	2,566	2,371	2,161	– 195	–210
	Functionally Obsolete	3,753	3,844	3,883	+ 91	+39
	Sub-standard for Load Only	1,438	1,465	1,400	+ 27	–65
Off-system Bridge-class Culverts	Structurally Deficient	70	62	74	– 8	+12
	Functionally Obsolete	561	611	564	+ 50	–47
	Sub-standard for Load Only	51	53	51	+2	–2
All Non-sufficient Bridges		**14,255**	**14,192**	**13,974**	**–63**	**–218**
Note. In September 2001, bridge records included 83 bridges not classified by condition. In September 2002, bridge records included 68 bridges not classified by condition.						

During FY 2002, the number of structurally deficient bridges decreased by 268. The number of functionally obsolete bridges increased by 186. The number of sub-standard-for-load-only bridges decreased by 136.

Load-posted and Closed Bridges. As shown in the following table, in September 2002 Texas had 443 load-posted on-system bridges, down from 460 in September 2001, and 12 closed on-system bridges, down from 15 in September 2001. Texas had 3,113 load-posted off-system bridges, down from 3,324 in September 2001, and 193 closed off-system bridges, down from 215 in September 2001.

Table 3-8. Posted and Closed Bridges as of September 2002

District	On-system Bridges			Off-system Bridges		
	Posted	Closed	Recom-mended for Posting/ Closure	Posted	Closed	Recom-mended for Posting/ Closure
Abilene	19	0	8	162	14	21
Amarillo	5	0	15	42	0	0
Atlanta	30	0	9	10	6	31
Austin	24	0	0	114	21	1
Beaumont	10	0	4	90	1	71
Brownwood	15	0	2	88	4	24
Bryan	17	1	6	238	1	81
Childress	21	0	8	59	9	25
Corpus Christi	35	1	6	117	5	8
Dallas	63	3	37	112	26	193
El Paso	6	1	0	86	1	0
Fort Worth	16	1	1	263	13	74
Houston	2	0	0	350	8	0
Laredo	2	0	3	49	3	6
Lubbock	0	0	0	9	0	0
Lufkin	33	3	1	156	2	93
Odessa	2	0	0	2	0	0
Paris	36	0	29	131	9	230
Pharr	0	0	0	35	13	0
San Angelo	4	0	0	24	5	4
San Antonio	4	1	5	90	11	27
Tyler	11	0	5	109	5	195
Waco	50	0	2	418	16	108
Wichita Falls	7	1	3	92	11	45
Yoakum	31	0	0	267	9	79
Total	**443**	**12**	**144**	**3,113**	**193**	**1,316**

Local governments are legally required to comply with a TxDOT inspector's request to load-post an off-system bridge. Federal law requires that load-posting signs be installed within 90 days of a change in status indicating deficiency of an on-system bridge and within 180 days of a change in status indicating deficiency of an off-system bridge. Posting of a bridge can take several months: TxDOT inspects the bridge, analyzes the inspection data, and makes a formal posting recommendation. For off-system bridges, the local government acknowledges the request and arranges for fabrication of appropriate signs. (At the request of the local government, TxDOT will supply the signs and make them available to the local government for installation.) When the local government installs the signs, a TxDOT inspector verifies compliance. In September 2002, Texas had 144 on-system bridges and 1,316 off-system bridges recommended for posting or closure or at some stage of getting the posting signs erected.

Local governments are encouraged but not legally required to comply with a request to close an off-system bridge. To encourage compliance, TxDOT uses its Participation-Waived Project/Equivalent Match Project (PWP/EMP) program, described in Chapter 5 of this report, to encourage compliance by local governments with recommendations for posting or closure of off-

system bridges. Local governments cannot participate in the PWP/EMP program until TxDOT confirms their compliance with all requests to post or close off-system roads in their jurisdiction.

Land-locking Bridges. The Texas Transportation Code establishes the minimum load that un-posted Texas bridges must be able to carry. Bridges unable to safely support that minimum load must be load-posted to protect them and the people who travel them from possible harm. This minimum load is the state legal load: in general, the maximum gross load on any truck cannot exceed 80,000 lbs., the maximum load on any tandem axles cannot exceed 34,000 lbs., and the maximum load on any single axle cannot exceed 20,000 lbs.

However, vehicles exceeding posted limits may use load-posted bridges under the following condition: by Texas law, a carrier is eligible for an annual "2060" permit at a fee allowing transport of excess loads on a land-locking bridge. These 2060-permitted loads may be a maximum of 10% per axle and 5% gross over the state legal load. In addition, certain vehicles identified in Chapter 622 of the Texas Transportation Code that exceed posted load capacity can legally use load-posted bridges.

Land-locking bridges limit the movement of legal loads into an area by imposing load restrictions or by being closed. TxDOT identifies a bridge or combination of bridges as land-locking only if no other public road into the area—and it must be a public road shown on a map maintained by TxDOT—is capable of supporting legal loads. As shown in the following table, in September 2002 Texas had 128 land-locking on-system bridges, down from 167 in September 2001, and 1,083 land-locking off-system bridges, down from 1,188 in September 2001.

Permitted vehicles that exceed posted limits may legally use land-locking bridges. Use of land-locking bridges for excess loads can increase risk of damage to the bridge. However, failure to use such a bridge can inhibit commerce in the land-locked region.

Table 3-9. Land-locking Bridges as of September 2002

District	On-system Land-locking Bridges	Off-system Land-locking Bridges
Abilene	1	27
Amarillo	4	6
Atlanta	16	6
Austin	6	15
Beaumont	3	40
Brownwood	4	18
Bryan	4	98
Childress	7	23
Corpus Christi	7	42
Dallas	30	67
El Paso	5	15
Fort Worth	3	79
Houston	0	116
Laredo	2	47
Lubbock	0	0
Lufkin	7	84
Odessa	0	2
Paris	13	61
Pharr	0	9
San Angelo	0	8
San Antonio	0	18
Tyler	0	63
Waco	11	145
Wichita Falls	2	25
Yoakum	3	69
Total	**128**	**1,083**

In March 2001, TxDOT began tracking information about land-locking bridges and giving special consideration to programming bridge projects that include land-locking bridges.

Chapter 4 – Condition of Span-type Bridges

Focus on Span-type Bridges. Span-type bridges are structurally more complex than bridge-class culverts, which are usually covered with embankment. As shown in Table 3-7, Texas span-type bridges have higher levels of structural deficiency and functional obsolescence than bridge-class culverts.

Analyses of the condition of Texas bridges based on bridge counts, as provided in the previous chapter, focus on the number of sites where bridges pose structural concerns and the potential for traffic disruption. However, span-type bridges vary widely in size, and additional descriptions of the condition of span-type bridges by bridge deck area focus on relative costs for bridge owners to repair, rehabilitate, or replace them.

The following figures show the condition of span-type bridges in September 2002 by count and by deck area. In September 2002, 9% of all span-type bridges were structurally deficient, and 4% of all span-type deck area was structurally deficient.

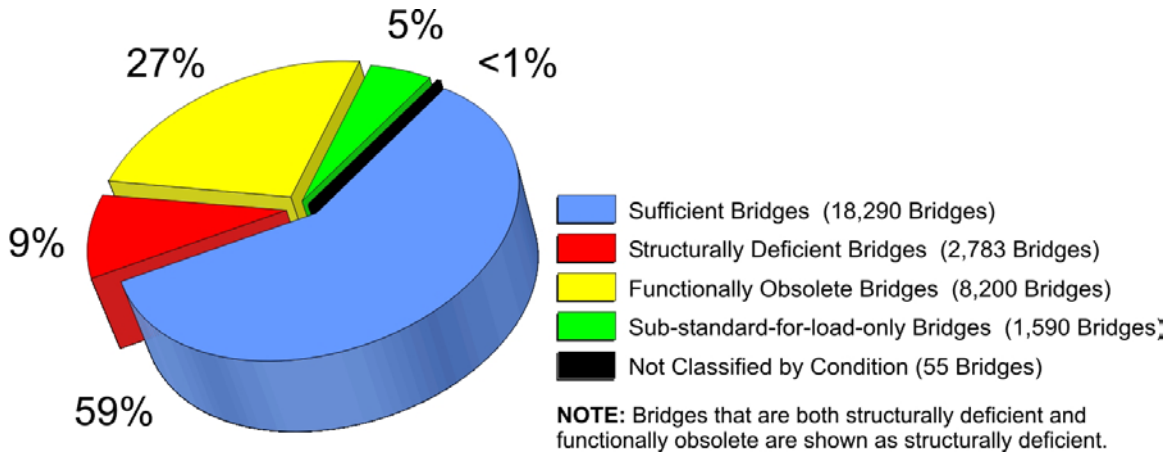


Figure 4-1. Condition of On- and Off-system Span-type Bridges by Count in September 2002 (30,918 Bridges Total)

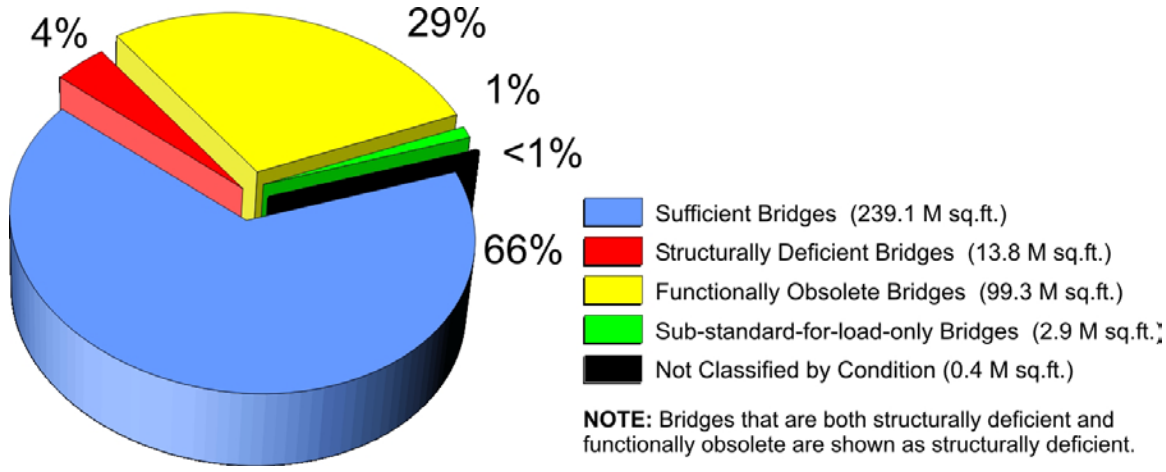


Figure 4-2. Condition of On- and Off-system Span-type Bridge Deck Area in September 2002

The following figures show the condition of on-system span-type bridges in September 2002 by count and by deck area. By both count and deck area, 3% of all on-system span-type bridges were structurally deficient in September 2002. In September 2002, 23% of all on-system span-type bridges were functionally obsolete by count, but 26% of all on-system span-type bridge deck area was functionally obsolete. In September 2002, 1% of all on-system span-type bridges were sub-standard-for-load-only, but 0.2% of all on-system span-type bridge deck area was sub-standard-for-load-only.

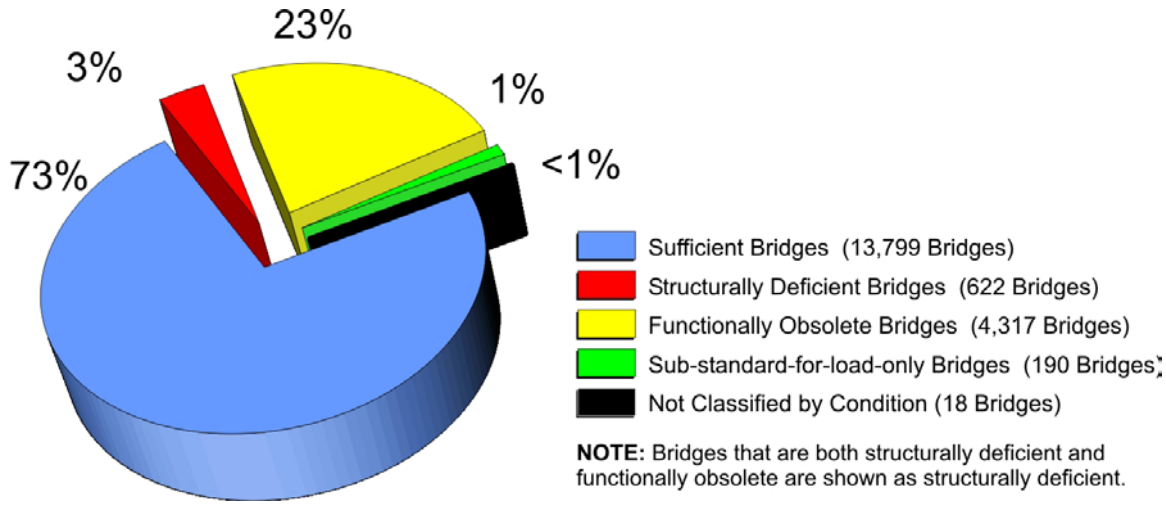


Figure 4-3. Condition of On-system Span-type Bridges by Count in September 2002

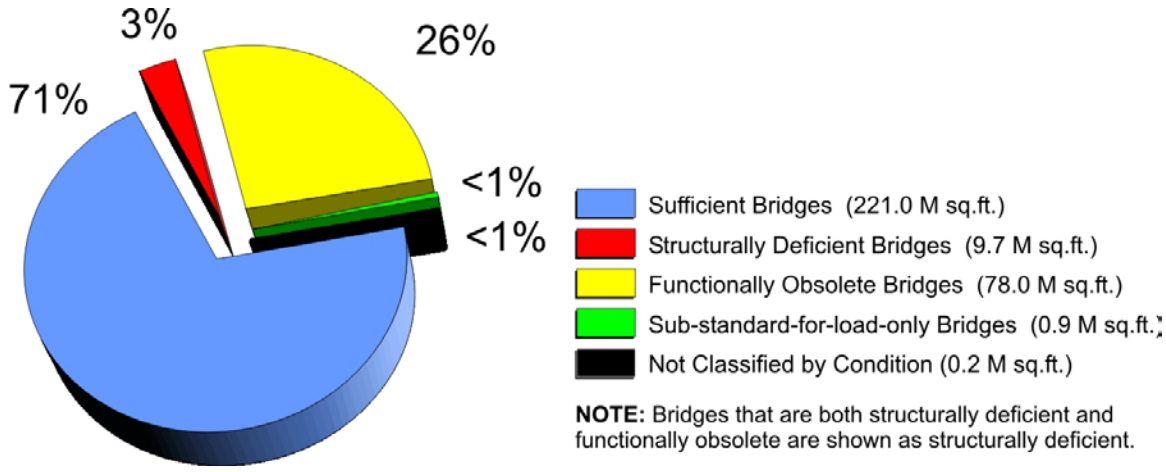


Figure 4-4. Condition of On-system Span-type Bridge Deck Area in September 2002

The following figures show the condition of off-system span-type bridges in FY 2002 by count and by deck area. Although 18% of all off-system span-type bridges were structurally deficient in September 2002, only 9% of the total off-system span-type bridge deck area was structurally deficient. However, 32% of all off-system span-type bridges were functionally obsolete, and 45% of the total off-system span-type bridge deck area was functionally obsolete. Twelve percent of all off-system span-type bridges were sub-standard-for-load-only, but only 4% of the total off-system span-type bridge deck area was sub-standard-for-load-only.

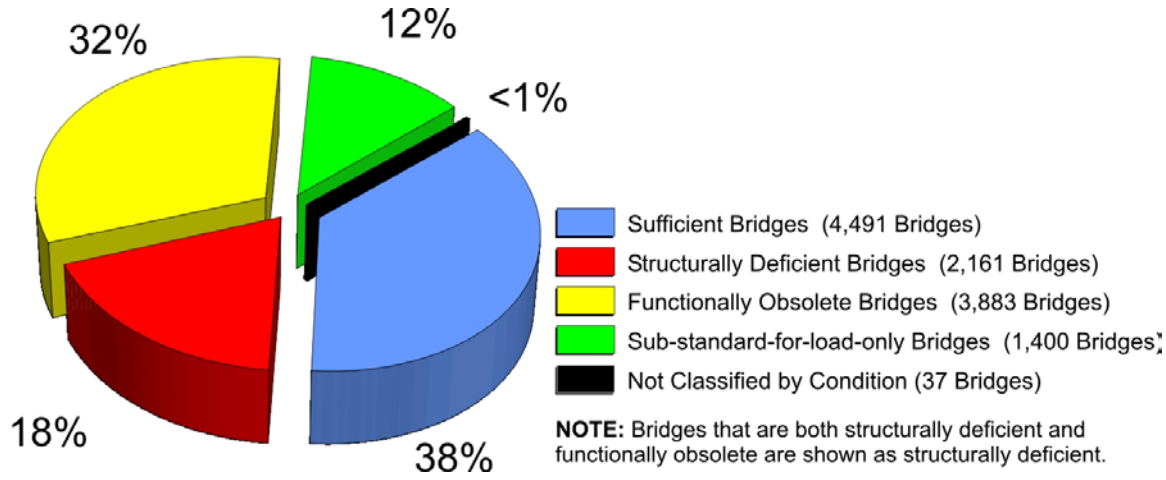


Figure 4-5. Condition of Off-system Span-type Bridges by Count in September 2002

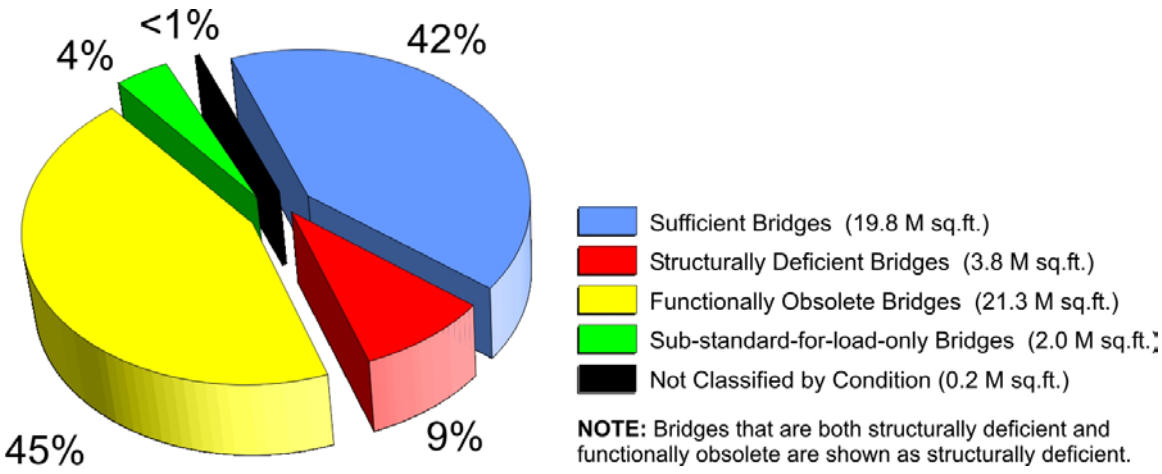


Figure 4-6. Condition of Off-system Span-type Bridge Deck Area in September 2002

For both on- and off-system span-type bridges, bridge counts show higher percentages of structural deficiency and sub-standard-for-load-only condition than do bridge deck area, indicating that the cost to remedy these conditions may be lower than the counts suggest. However, the percentage of functionally obsolete bridges by count is consistently lower than the percentage of functionally obsolete bridges by deck area, indicating that the cost to correct functional obsolescence may be higher than the counts suggests.
The following figure shows age and condition of on-system Texas span-type bridges.

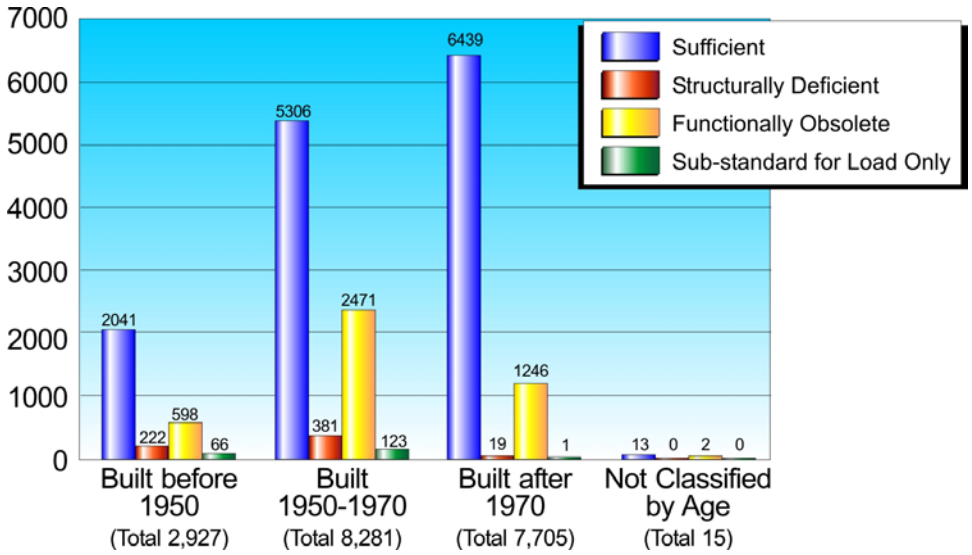


Figure 4-7. Age and Condition of On-system Span-type Bridges by Count in September 2002

The following figure shows age and condition of off-system Texas span-type bridges.

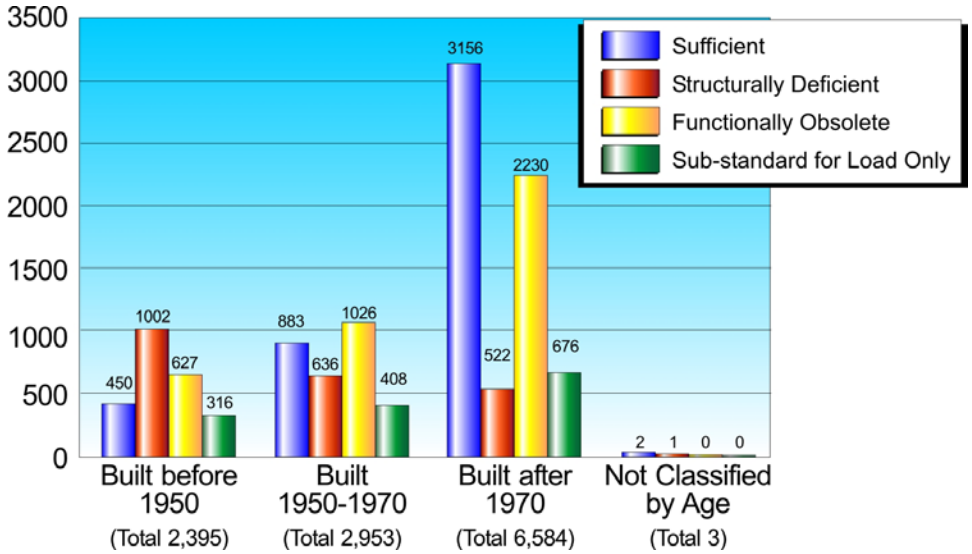


Figure 4-8. Age and Condition of Off-system Span-type Bridges by Count in September 2002

Newer span-type bridges show greater numbers of sufficient bridges. More on-system bridges built between 1950 and 1970 are structurally deficient, functionally obsolete, or sub-standard-for-load-only than older or newer on-system span-type bridges. For off-system bridges, newer span-type bridges show fewer structurally deficient bridges. However, for off-system bridges the numbers for functionally obsolete and sub-standard-for-load-only bridges increase for newer groups of bridges.

Structurally Deficient Span-type Bridges. As shown in Figures 4-3 and 4-4, in September 2002 Texas had 622 structurally deficient on-system span-type bridges, with a total of 9,703,126 sq. ft. of structurally deficient deck area. This represents a decrease of 63 structurally deficient on-system span-type bridges (see Table 3-7) and a decrease of 236,223 sq. ft.[4] of structurally deficient on-system span-type bridge deck area (see Table 4-14) during FY 2002.

[4] See *Report on Texas Bridges as of September 2001*.

The following tables show the number of on-system structurally deficient span-type bridges and their deck area for each district.

Table 4-1. Count of Structurally Deficient On-system Span-type Bridges by District in September 2002

District	Structurally Deficient Bridges		District	Structurally Deficient Bridges	
	Count	% On-System Count in District		Count	% of On-System Count in District
Abilene	21	3.2%	Laredo	4	1.5%
Amarillo	85	19.7%	Lubbock	0	0%
Atlanta	42	8.3%	Lufkin	50	9.8%
Austin	35	3.7%	Odessa	8	2.4%
Beaumont	21	3.2%	Paris	40	5.0%
Brownwood	1	0.2%	Pharr	3	0.7%
Bryan	12	1.8%	San Angelo	1	0.2%
Childress	31	11.7%	San Antonio	13	0.9%
Corpus Christi	21	2.8%	Tyler	13	2.2%
Dallas	61	2.6%	Waco	21	2.4%
El Paso	3	0.6%	Wichita Falls	24	4.6%
Fort Worth	81	6.1%	Yoakum	16	1.9%
Houston	15	0.7%	**Total**	**622**	**3.3%**

Table 4-2. Deck Area of Structurally Deficient On-system Span-type Bridges by District in September 2002

District	Structurally Deficient Bridges		District	Structurally Deficient Bridges	
	Deck Area (sq. ft.)	% of On-System Area in District		Deck Area (sq. ft.)	% of On-System Area in District
Abilene	182,268	3.7%	Laredo	9,994	0.3%
Amarillo	913,126	16.9%	Lubbock	0	0%
Atlanta	115,489	1.9%	Lufkin	336,554	6.1%
Austin	418,617	2.4%	Odessa	112,946	3.1%
Beaumont	1,123,709	9.9%	Paris	684,848	10.2%
Brownwood	11,985	0.4%	Pharr	6,644	0.1%
Bryan	69,112	1.2%	San Angelo	18,875	0.4%
Childress	254,419	9.2%	San Antonio	126,037	0.5%
Corpus Christi	993,059	9.0%	Tyler	112,932	1.6%
Dallas	1,361,247	3.0%	Waco	98,610	1.0%
El Paso	9,097	0.1%	Wichita Falls	487,759	7.5%
Fort Worth	1,100,520	5.5%	Yoakum	98,119	1.0%
Houston	1,057,160	1.6%	**Total**	**9,703,126**	**3.2%**

The following figure shows the distribution by district of on-system span-type bridge deck area that is structurally deficient.

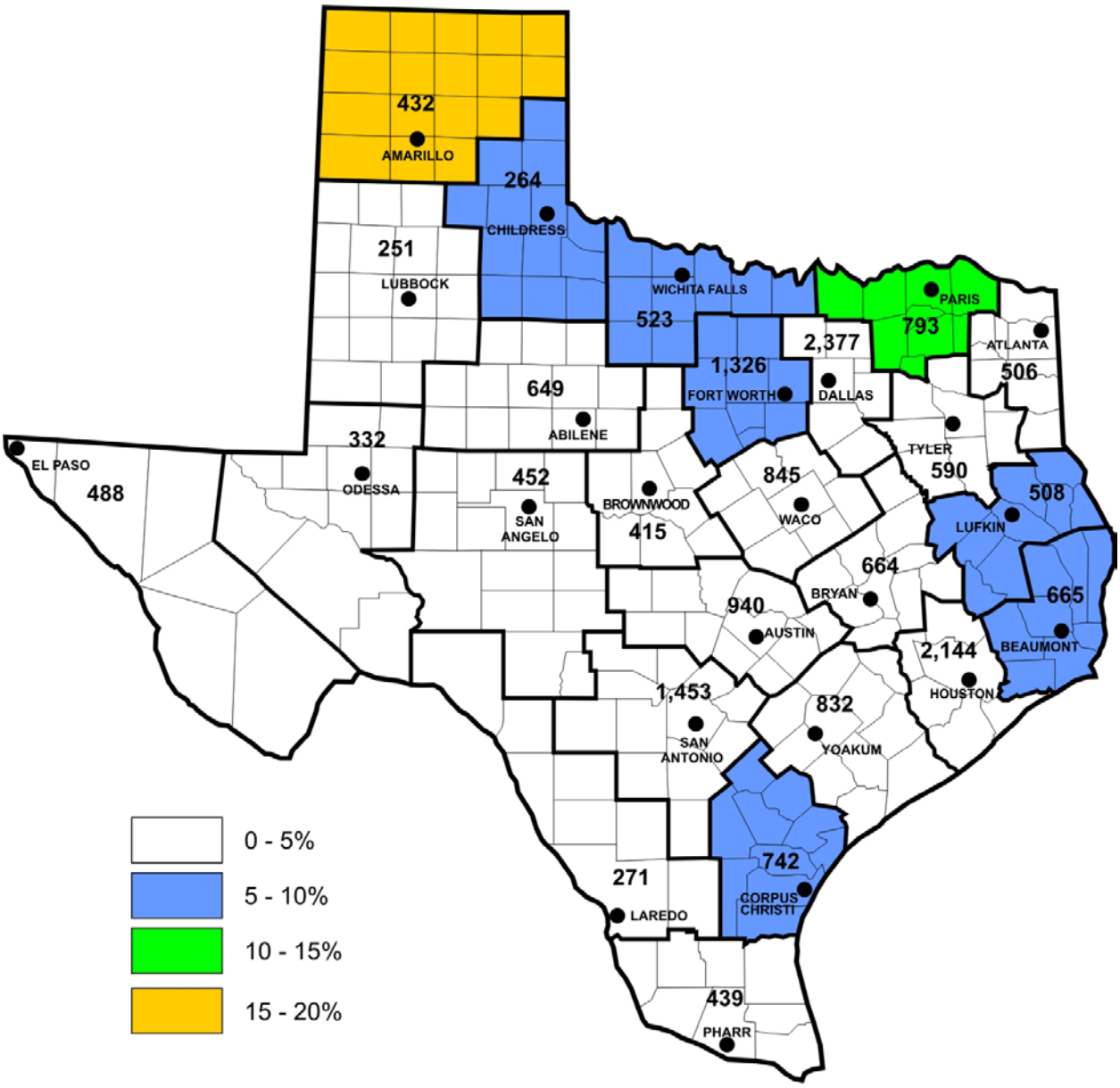


Figure 4-9. Percent of Structurally Deficient On-system Span-type Bridge Deck Area in September 2002 by District

As shown in Figures 4-5 and 4-6, in September 2002 Texas had 2,161 structurally deficient off-system span-type bridges, with a total of 3,787,927 sq. ft. of structurally deficient deck area. This represents a decrease of 210 structurally deficient off-system span-type bridges (see Table 3-7)

and a reduction of 62,868 sq. ft.[5] of structurally deficient off-system span-type bridge deck area since September 2001.

The following tables show the number of off-system structurally deficient span-type bridges and their deck area for each district.

Table 4-3. Count of Structurally Deficient Off-system Span-type Bridges by District in September 2002

District	Structurally Deficient Bridges		District	Structurally Deficient Bridges	
	Count	% of Off-System Count in District		Count	% of Off-System Count in District
Abilene	105	35.6%	Laredo	9	8.3%
Amarillo	16	22.5%	Lubbock	5	31.3%
Atlanta	36	24.3%	Lufkin	143	29.8%
Austin	64	10.8%	Odessa	1	16.7%
Beaumont	60	18.0%	Paris	251	33.7%
Brownwood	69	27.1%	Pharr	24	8.2%
Bryan	145	27.7%	San Angelo	21	27.3%
Childress	63	36.2%	San Antonio	47	10.7%
Corpus Christi	66	25.2%	Tyler	119	25.2%
Dallas	143	10.2%	Waco	254	30.1%
El Paso	5	3.1%	Wichita Falls	78	22.0%
Fort Worth	185	21.0%	Yoakum	153	16.1%
Houston	99	4.7%	**Total/Avg.**	**2,161**	**18.1%**

Table 4-4. Deck Area of Structurally Deficient Off-system Span-type Bridges by District in September 2002

District	Structurally Deficient Bridges		District	Structurally Deficient Bridges	
	Deck Area (sq. ft.)	% of Off-System Area in District		Deck Area (sq. ft.)	% of Off-System Area in District
Abilene	127,472	22.6%	Laredo	9,203	1.0%
Amarillo	155,474	32.9%	Lubbock	4,638	11.8%
Atlanta	32,266	7.2%	Lufkin	101,296	21.9%
Austin	76,352	2.5%	Odessa	629	7.2%
Beaumont	60,114	8.3%	Paris	183,295	23.1%
Brownwood	83,071	19.2%	Pharr	36,767	1.9%
Bryan	138,195	23.1%	San Angelo	50,519	14.9%
Childress	66,744	29.8%	San Antonio	131,187	3.9%
Corpus Christi	108,217	20.4%	Tyler	98,690	15.7%
Dallas	458,178	3.9%	Waco	326,568	18.8%
El Paso	96,845	10.7%	Wichita Falls	67,398	15.2%
Fort Worth	567,570	14.9%	Yoakum	157,919	10.7%
Houston	649,320	5.6%	**Total/Avg.**	**3,787,927**	**8.0%**

[5] See *Report on Texas Bridges as of September 2001.*

The following figure shows the distribution by district of off-system span-type bridge deck area that is structurally deficient.

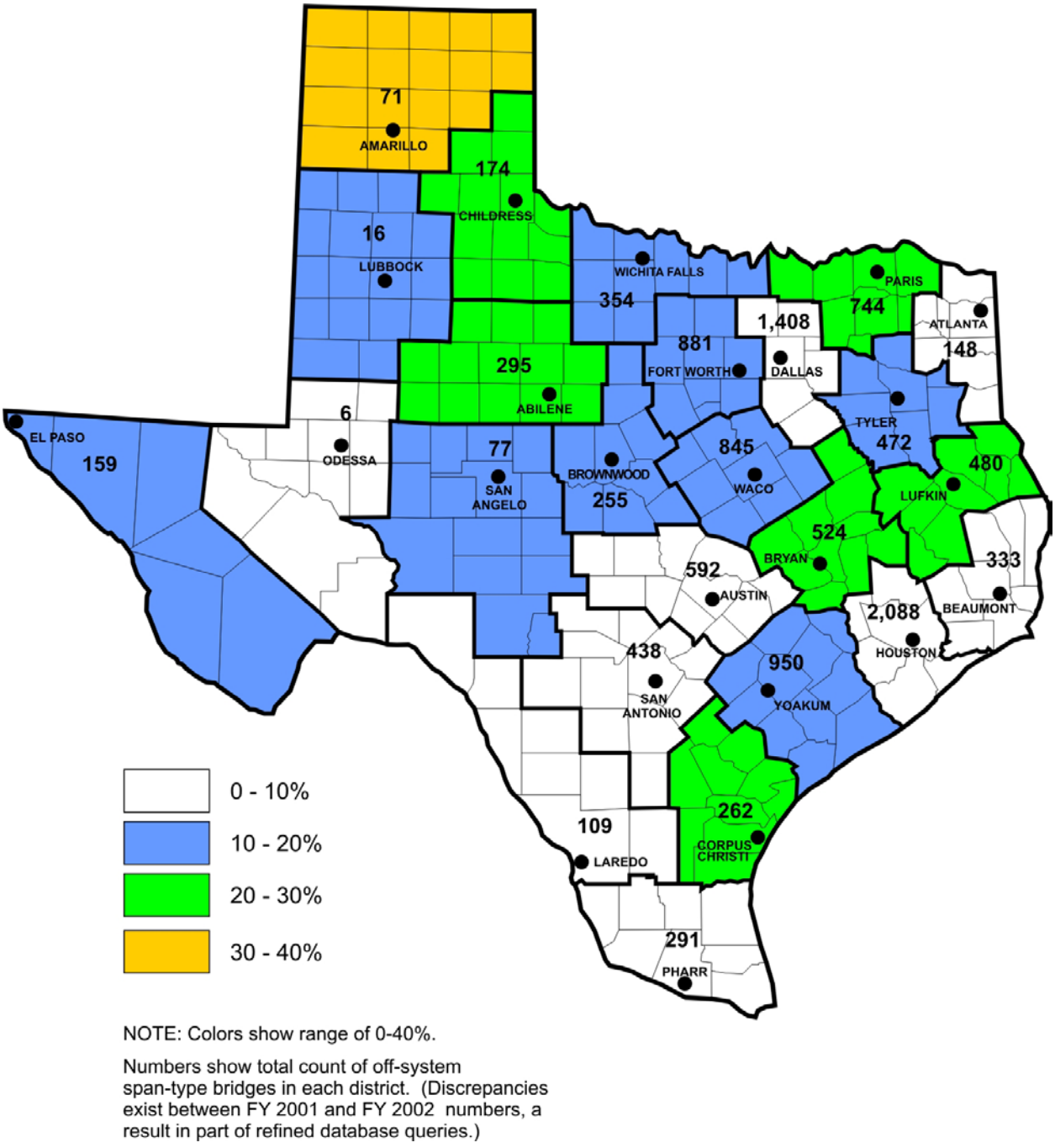


Figure 4-10. Percent of Structurally Deficient Off-system Span-type Bridge Deck Area in September 2002 by District

The following figure shows the distribution by county of off-system span-type bridge deck area that is structurally deficient.

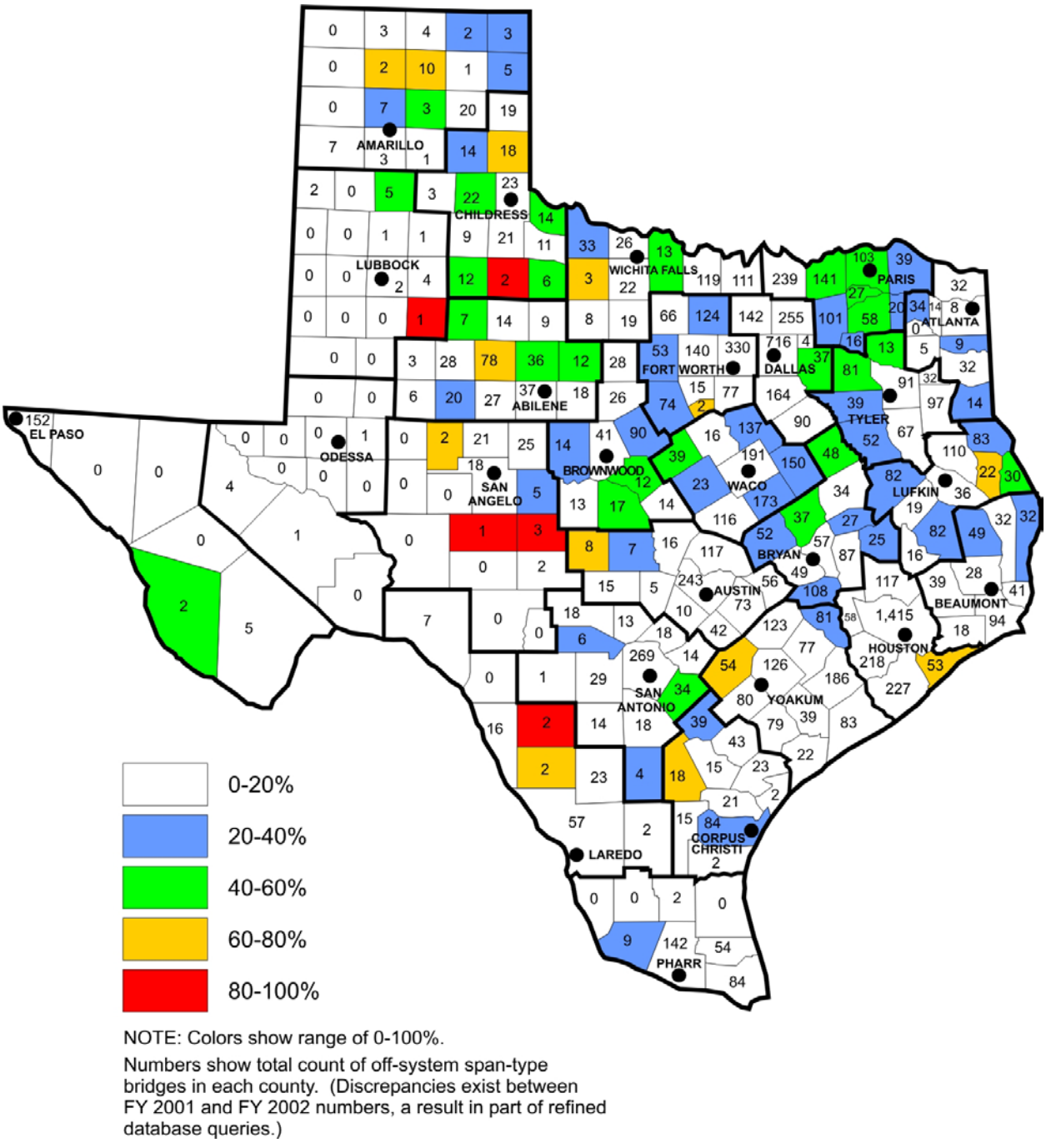


Figure 4-11. Percent of Structurally Deficient Off-system Span-type Bridge Deck Area in September 2002 by County

See Appendix A for information on structurally deficient off-system span-type bridges in Texas counties.

Functionally Obsolete Span-type Bridges. As shown in Figures 4-3 and 4-4, in September 2002 Texas had 4,317 functionally obsolete on-system span-type bridges, with a total of 78,018,216 sq. ft. of functionally obsolete deck area. This represents an increase of 134 functionally obsolete on-system span-type bridges (see Table 3-7) and an increase of 1,237,612 sq. ft. [6]of functionally obsolete on-system span-type bridge deck area (see Table 4-14) since September 2001.

The following tables show the number of on-system functionally obsolete span-type bridges and their deck area for each district.

Table 4-5. Count of Functionally Obsolete On-system Span-type Bridges by District in September 2002

District	Functionally Obsolete Bridges		District	Functionally Obsolete Bridges	
	Count	% of On-System Count in District		Count	% of On-System Count in District
Abilene	136	21.0%	Laredo	29	10.7%
Amarillo	58	13.4%	Lubbock	61	24.3%
Atlanta	63	12.5%	Lufkin	62	12.2%
Austin	257	27.3%	Odessa	34	10.2%
Beaumont	121	18.2%	Paris	145	18.3%
Brownwood	41	9.9%	Pharr	121	27.6%
Bryan	97	14.6%	San Angelo	52	11.5%
Childress	4	1.5%	San Antonio	366	25.2%
Corpus Christi	83	11.2%	Tyler	95	16.1%
Dallas	949	39.9%	Waco	203	22.8%
El Paso	147	30.1%	Wichita Falls	65	12.4%
Fort Worth	287	21.6%	Yoakum	134	16.1%
Houston	707	33.0%	**Total**	**4,317**	**22.8%**

[6] See *Report on Texas Bridges as of September 2001.*

Table 4-6. Deck Area of Functionally Obsolete On-system Span-type Bridges by District in September 2002

District	Functionally Obsolete Bridges		District	Functionally Obsolete Bridges	
	Deck Area (Sq. Ft.)	% of On-System Area in District		Deck Area (Sq. Ft.)	% of District On-System Area in District
Abilene	903,468	18.2%	Laredo	631,011	20.1%
Amarillo	834,508	15.4%	Lubbock	818,023	23.1%
Atlanta	607,844	9.9%	Lufkin	443,283	8.0%
Austin	4,222,176	24.1%	Odessa	337,307	9.2%
Beaumont	1,549,899	13.7%	Paris	748,455	11.1%
Brownwood	278,742	9.2%	Pharr	1,851,713	27.4%
Bryan	692,093	12.1%	San Angelo	582,490	11.4%
Childress	31,102	1.1%	San Antonio	8,374,544	34.0%
Corpus Christi	807,887	7.3%	Tyler	939,618	13.2%
Dallas	17,959,414	39.9%	Waco	2,906,356	30.8%
El Paso	2,688,529	39.3%	Wichita Falls	1,218,230	18.6%
Fort Worth	3,749,914	18.7%	Yoakum	1,914,485	19.7%
Houston	22,927,125	34.1%	**Total**	**78,018,216**	**26.1%**

The following figure shows the distribution by district of on-system span-type bridge deck area that is functionally obsolete.

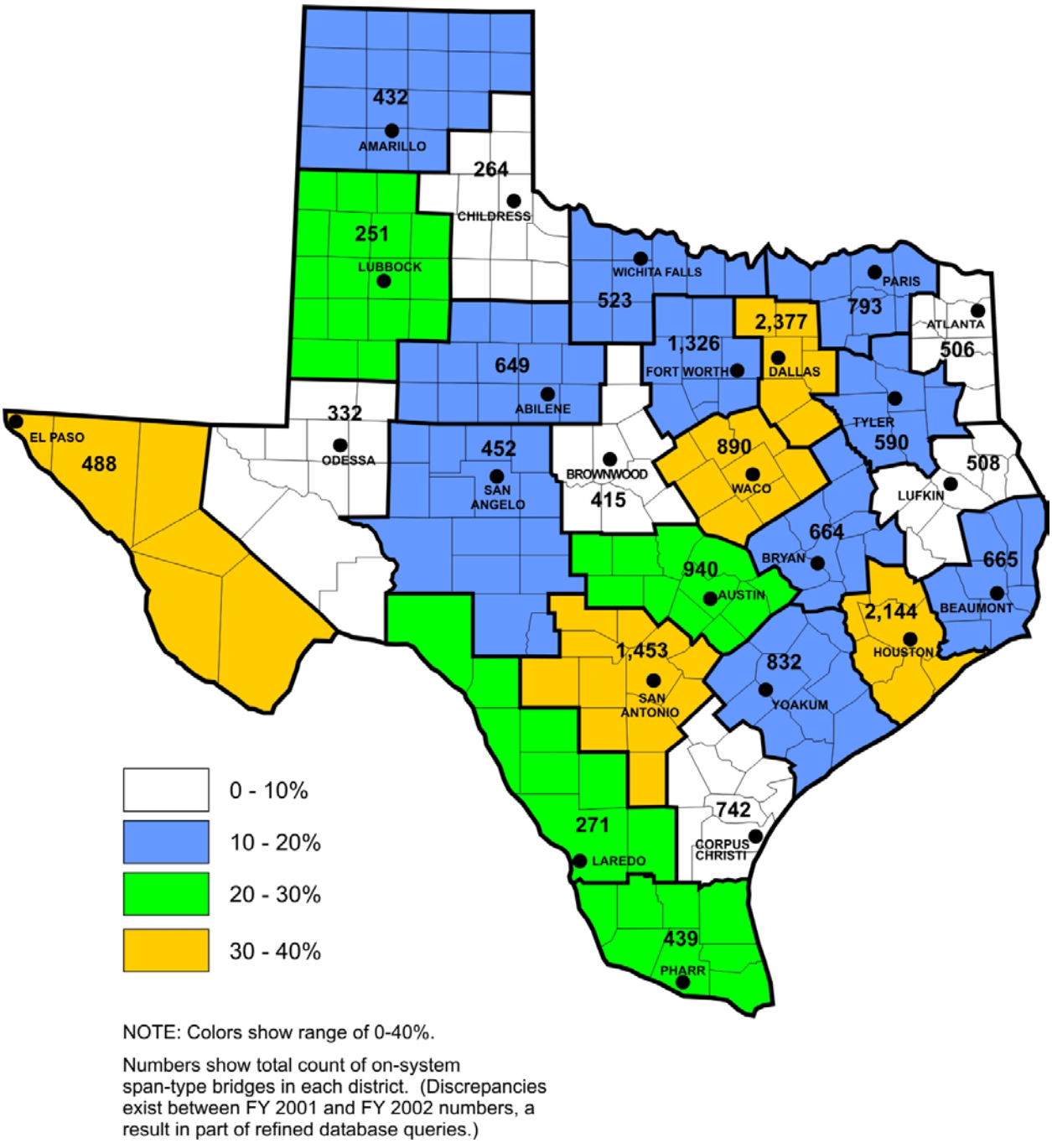


Figure 4-12. Percent of Functionally Obsolete On-system Span-type Bridge Deck Area in September 2002 by District

As shown in Figures 4-5 and 4-6, in September 2002 Texas had 3,883 functionally obsolete off-system span-type bridges, with a total of 21,311,692 sq. ft. of functionally obsolete deck area. This represents an increase of 39 functionally obsolete off-system span-type bridges (see Table

3-7) and an increase of 689,593 sq. ft.[7] of functionally obsolete off-system span-type bridge deck area (see Table 4-14) since September 2001.

The following tables show the number of off-system functionally obsolete span-type bridges and their deck area for each district.

Table 4-7. Count of Functionally Obsolete Off-system Span-type Bridges by District in September 2002

District	Functionally Obsolete Bridges		District	Functionally Obsolete	
	Count	% of Off-System Count in District		Count	% of Off-System Count in District
Abilene	47	15.9%	Laredo	50	45.9%
Amarillo	14	19.7%	Lubbock	2	12.5%
Atlanta	35	23.6%	Lufkin	121	25.2%
Austin	158	26.7%	Odessa	1	16.7%
Beaumont	80	24.0%	Paris	169	22.7%
Brownwood	46	16.1%	Pharr	66	22.7%
Bryan	159	30.3%	San Angelo	19	24.7%
Childress	14	8.0%	San Antonio	161	36.8%
Corpus Christi	42	16.0%	Tyler	151	32.0%
Dallas	680	48.2%	Waco	212	25.0%
El Paso	22	13.4%	Wichita Falls	81	22.9%
Fort Worth	269	30.4%	Yoakum	232	24.4%
Houston	1,056	50.5%	**Total/Avg.**	**3,883**	**32.4%**

Table 4-8. Deck Area of Functionally Obsolete Off-system Span-type Bridges by District in September 2002

District	Functionally Obsolete Bridges		District	Functionally Obsolete Bridges	
	Deck Area (sq. ft.)	% of Off-System Area in District		Deck Area (sq. ft.)	% of Off-System Area in District
Abilene	62,291	11.1%	Laredo	296,114	33.0%
Amarillo	98,632	20.9%	Lubbock	3,942	10.1%
Atlanta	180,982	40.3%	Lufkin	109,457	23.6%
Austin	859,703	27.7%	Odessa	400	4.6%
Beaumont	140,865	19.3%	Paris	139,038	17.5%
Brownwood	72,107	16.7%	Pharr	1,164,310	59.0%
Bryan	143,591	24.0%	San Angelo	63,465	18.8%
Childress	11,621	5.2%	San Antonio	1,586,339	46.8%
Corpus Christi	99,438	18.7%	Tyler	126,060	20.1%
Dallas	6,424,219	54.6%	Waco	481,287	27.7%
El Paso	168,637	18.6%	Wichita Falls	92,549	20.8%
Fort Worth	1,703,322	44.6%	Yoakum	257,102	17.4%
Houston	7,026,221	60.1%	**Total/Avg.**	**21,311,692**	**44.9%**

[7] See *Report on Texas Bridges as of September 2001*.

The following figure shows the distribution by district of off-system span-type bridge deck area that is functionally obsolete.

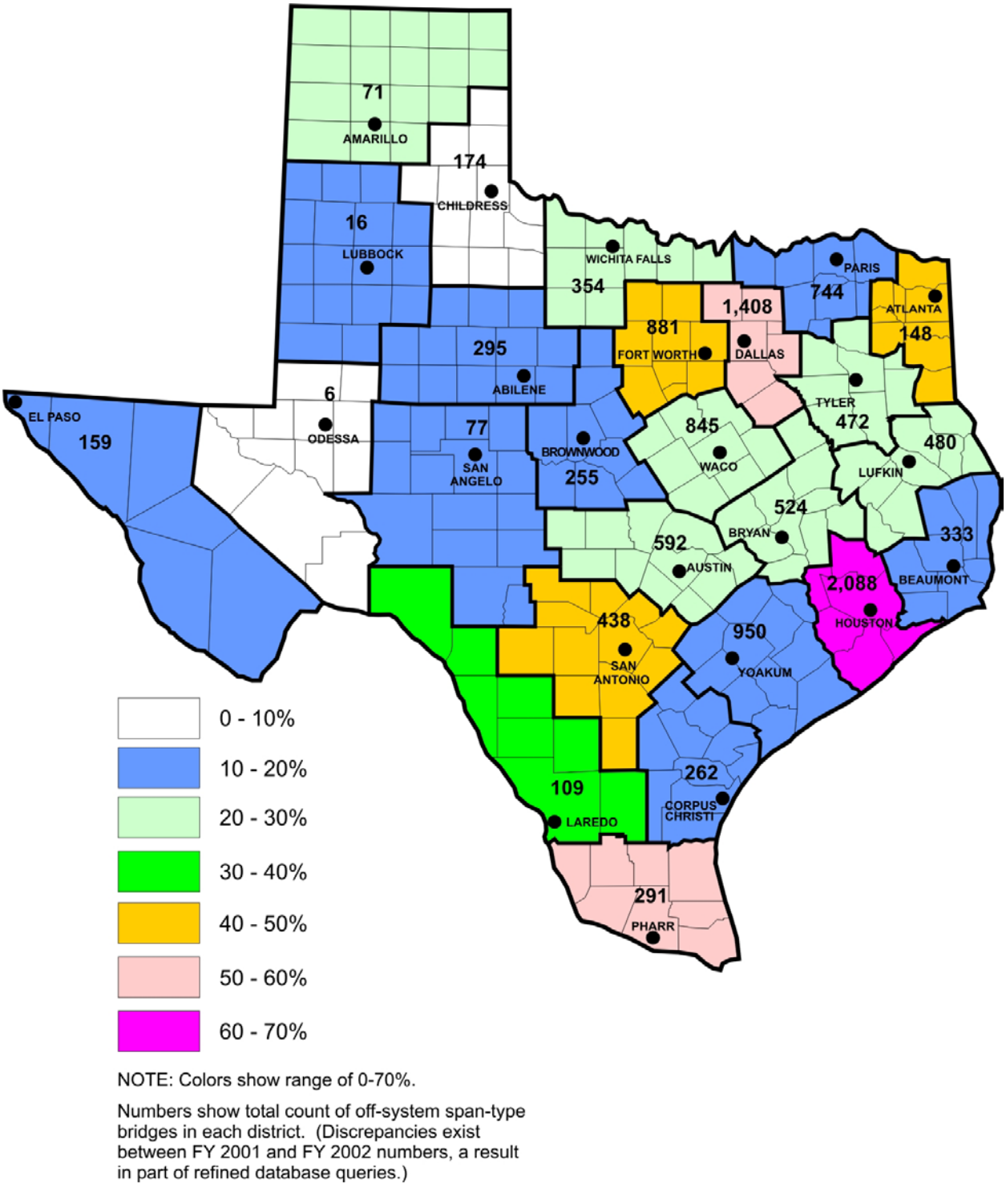


Figure 4-13. Percent of Functionally Obsolete Off-system Span-type Bridge Deck Area in September 2002 by District

The following figure shows the distribution by county of off-system span-type bridge deck area that is functionally obsolete.

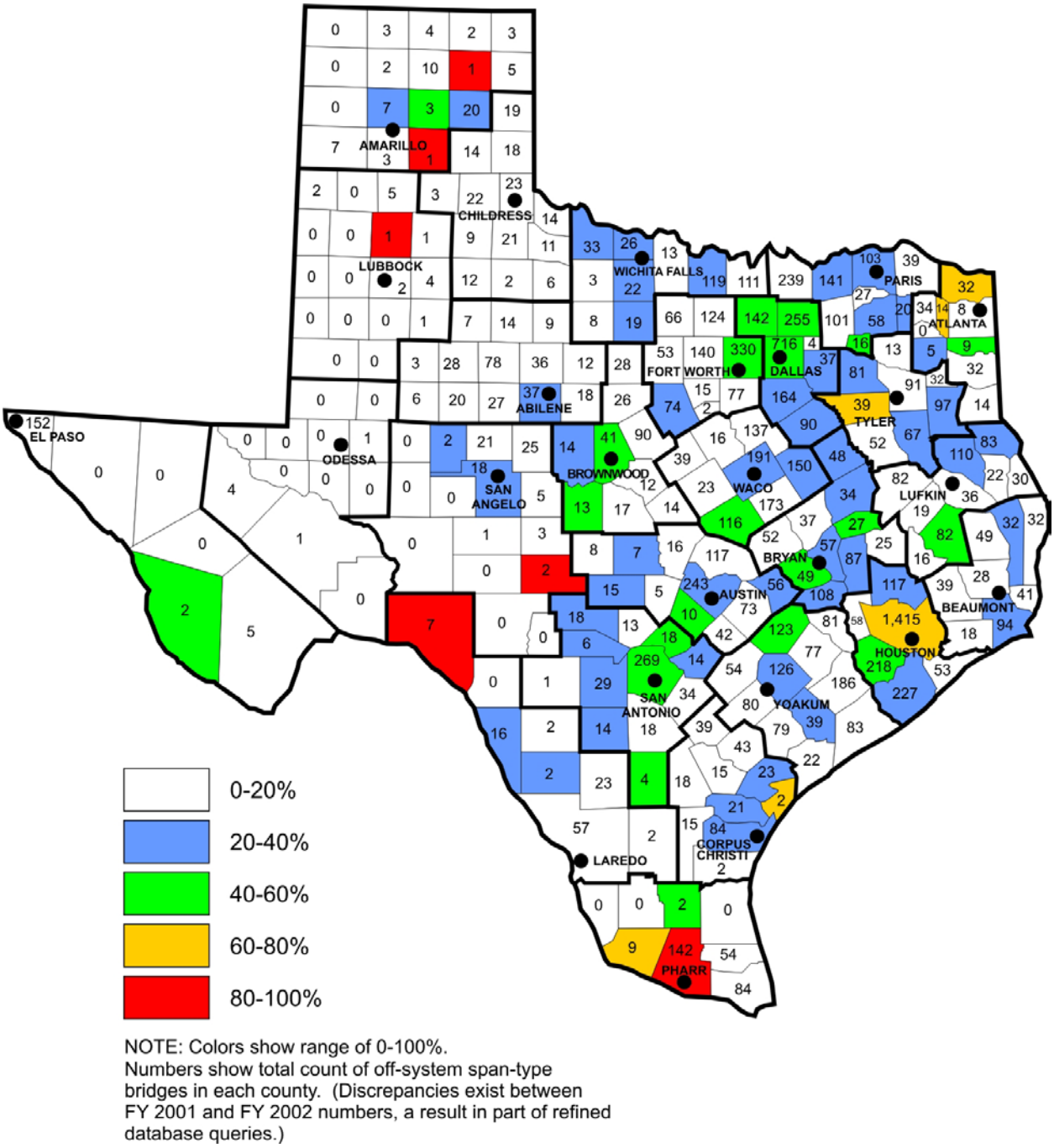


Figure 4-14. Percent of Functionally Obsolete Off-system Span-type Bridge Deck Area in September 2002 by County

See Appendix A for information on functionally obsolete off-system span-type bridges in Texas counties.

Sub-standard-for-Load-Only Span-type Bridges. As shown in Figures 4-3 and 4-4, in September 2002 Texas had 190 sub-standard-for-load-only on-system span-type bridges, with a total of 866,970 sq. ft. of sub-standard-for-load-only deck area. This represents a decrease of 47 sub-standard-for-load-only on-system span-type bridges (see Table 3-7) and a decrease of 569,708 sq. ft.[8] of sub-standard-for-load-only on-system span-type bridge deck area (see Table 4-14) since September 2001.

The following tables show the number of on-system sub-standard-for-load-only bridges and their deck area for each district.

Table 4-9. Count of Sub-standard-for-Load-Only On-system Span-type Bridges by District in September 2002

District	Sub-standard-for-Load-Only Bridges		District	Sub-standard-for-Load-Only Bridges	
	Count	% of On-System Count in District		Count	% of On-System Count in District
Abilene	15	2.3%	Laredo	3	1.1%
Amarillo	0	0%	Lubbock	0	0%
Atlanta	3	0.6%	Lufkin	9	1.8%
Austin	7	0.7%	Odessa	0	0%
Beaumont	7	1.1%	Paris	24	3.0%
Brownwood	6	1.4%	Pharr	0	0%
Bryan	6	0.9%	San Angelo	3	0.7%
Childress	19	7.2%	San Antonio	2	0.1%
Corpus Christi	15	2.0%	Tyler	4	0.7%
Dallas	21	0.9%	Waco	24	2.7%
El Paso	5	1.0%	Wichita Falls	6	1.1%
Fort Worth	5	0.4%	Yoakum	6	0.7%
Houston	0	0%	**Total/Avg.**	**190**	**1.0%**

[8] See *Report on Texas Bridges as of September 2001.*

Table 4-10. Deck Area of Sub-standard-for-Load-Only On-system Span-type Bridges by District in September 2002

District	Sub-standard-for-Load-Only Bridges		District	Sub-standard-for-Load-Only Bridges	
	Deck Area (sq. ft.)	% of On-System Area in District		Deck Area (sq. ft.)	% of On-System Area in District
Abilene	53,531	1.1%	Laredo	7,696	0.2%
Amarillo	0	0%	Lubbock	0	0%
Atlanta	14,971	0.2%	Lufkin	30,013	0.5%
Austin	21,024	0.1%	Odessa	0	0%
Beaumont	44,000	0.4%	Paris	94,694	1.4%
Brownwood	14,877	0.5%	Pharr	0	0%
Bryan	12,617	0.2%	San Angelo	27,185	0.5%
Childress	95,591	3.4%	San Antonio	68,452	0.3%
Corpus Christi	40,525	0.4%	Tyler	18,993	0.3%
Dallas	190,061	0.4%	Waco	59,526	0.6%
El Paso	5,457	0.1%	Wichita Falls	47,538	0.7%
Fort Worth	8,549	0.04%	Yoakum	11,670	0.1%
Houston	0	0%	**Total/Avg.**	**866,970**	**0.3%**

The following figure shows the distribution by district of off-system span-type bridge deck area that is sub-standard for load only.

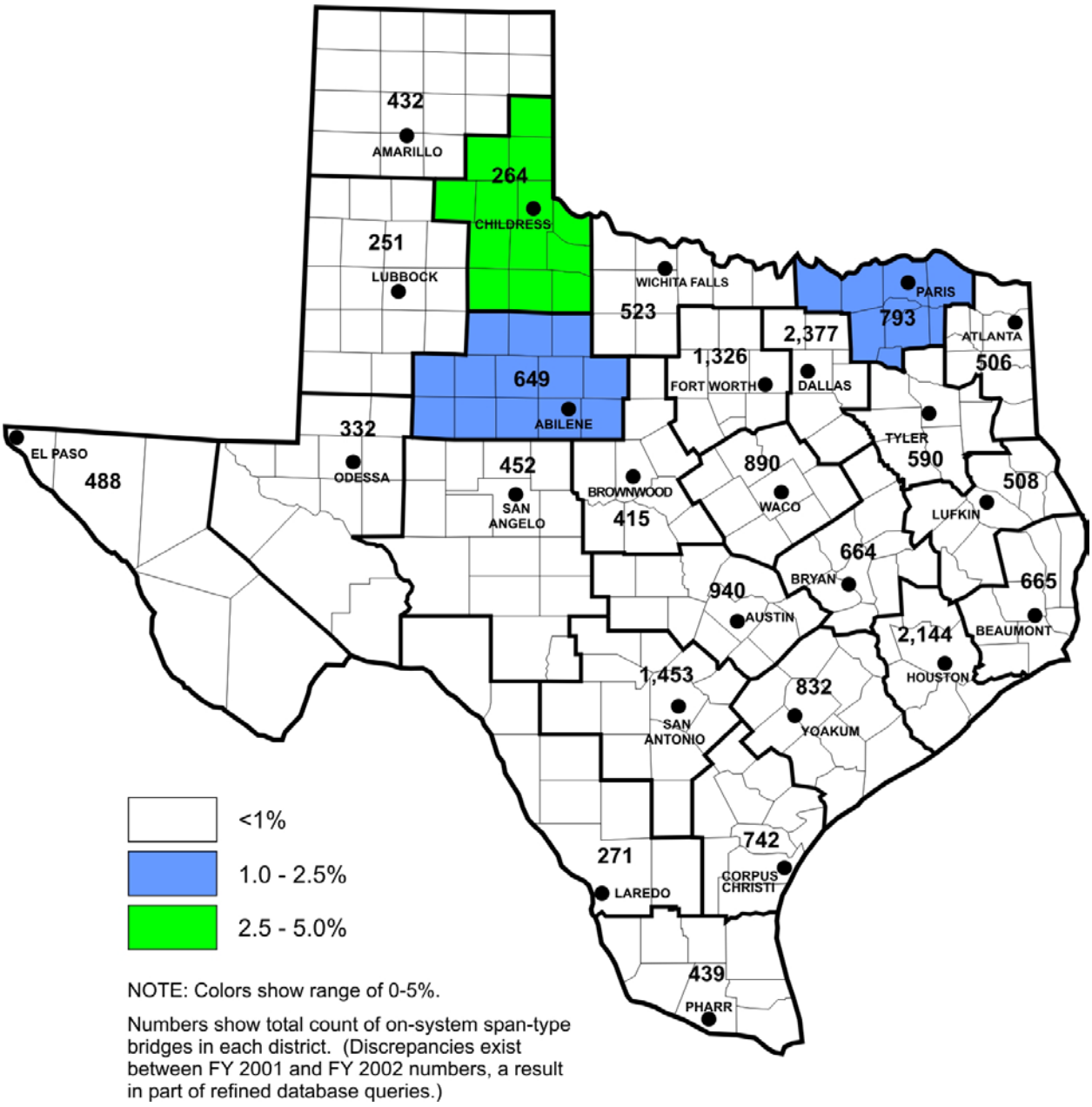


Figure 4-15. Percent of Sub-standard-for-Load-Only On-system Span-type Bridge Deck Area in September 2002 by District

As shown in Figures 4-5 and 4-6, in September 2002 Texas had 1,400 sub-standard-for-load-only off-system span-type bridges, with a total of 2,038,946 sq. ft. of sub-standard-for-load-only deck area. This represents a decrease of 65 sub-standard-for-load-only off-system span-type

bridges (see Table 3-7) and a decrease of 10,753 sq. ft.[9] of sub-standard-for-load-only off-system span-type bridge deck area (see Table 4-14) since September 2001.

The following tables show the number of off-system sub-standard-for-load-only bridges and their deck area for each district.

Table 4-11. Count of Sub-standard-for-Load-Only Off-system Span-type Bridges by District in September 2002

District	Sub-standard-for-Load-Only Bridges		District	Sub-standard-for-Load-Only Bridges	
	Count	% of Off-System Count in District		Count	% of Off-System Count in District
Abilene	58	19.7%	Laredo	9	8.3%
Amarillo	21	29.6%	Lubbock	3	18.8%
Atlanta	11	7.4%	Lufkin	76	15.8%
Austin	25	4.2%	Odessa	0	0%
Beaumont	80	24.0%	Paris	65	8.7%
Brownwood	23	9.0%	Pharr	14	4.8%
Bryan	80	15.3%	San Angelo	8	10.4%
Childress	20	11.5%	San Antonio	30	6.8%
Corpus Christi	37	14.1%	Tyler	95	20.1%
Dallas	82	5.8%	Waco	133	15.7%
El Paso	70	44.0%	Wichita Falls	39	11.0%
Fort Worth	87	9.9%	Yoakum	144	15.2%
Houston	190	9.1%	**Total/Avg.**	**1,400**	**11.7%**

Table 4-12. Deck Area of Sub-standard-for-Load-Only Off-system Span-type Bridges by District in September 2002

District	Sub-standard-for-Load-Only Bridges		District	Sub-standard-for-Load-Only Bridges	
	Deck Area (sq. ft.)	% of Off-System Area in District		Deck Area (sq. ft.)	% of Off-System Area in District
Abilene	101,301	18.0%	Laredo	9,604	1.1%
Amarillo	64,739	13.7%	Lubbock	2,540	6.5%
Atlanta	8,826	2.0%	Lufkin	50,924	11.0%
Austin	24,371	0.8%	Odessa	0	0%
Beaumont	197,538	27.1%	Paris	50,677	6.4%
Brownwood	17,198	4.0%	Pharr	23,028	1.2%
Bryan	60,666	10.2%	San Angelo	28,124	8.3%
Childress	15,551	6.9%	San Antonio	110,872	3.3%
Corpus Christi	41,573	7.8%	Tyler	100,024	16.0%
Dallas	131,725	1.1%	Waco	158,429	9.1%
El Paso	152,888	16.8%	Wichita Falls	32,872	7.4%
Fort Worth	110,432	2.9%	Yoakum	216,749	14.6%
Houston	328,295	2.8%	**Total/Avg.**	**2,038,946**	**4.3%**

[9] See *Report on Texas Bridges as of September 2001*.

The following figure shows the distribution by district based on deck area of off-system span-type bridges that are sub-standard for load only.

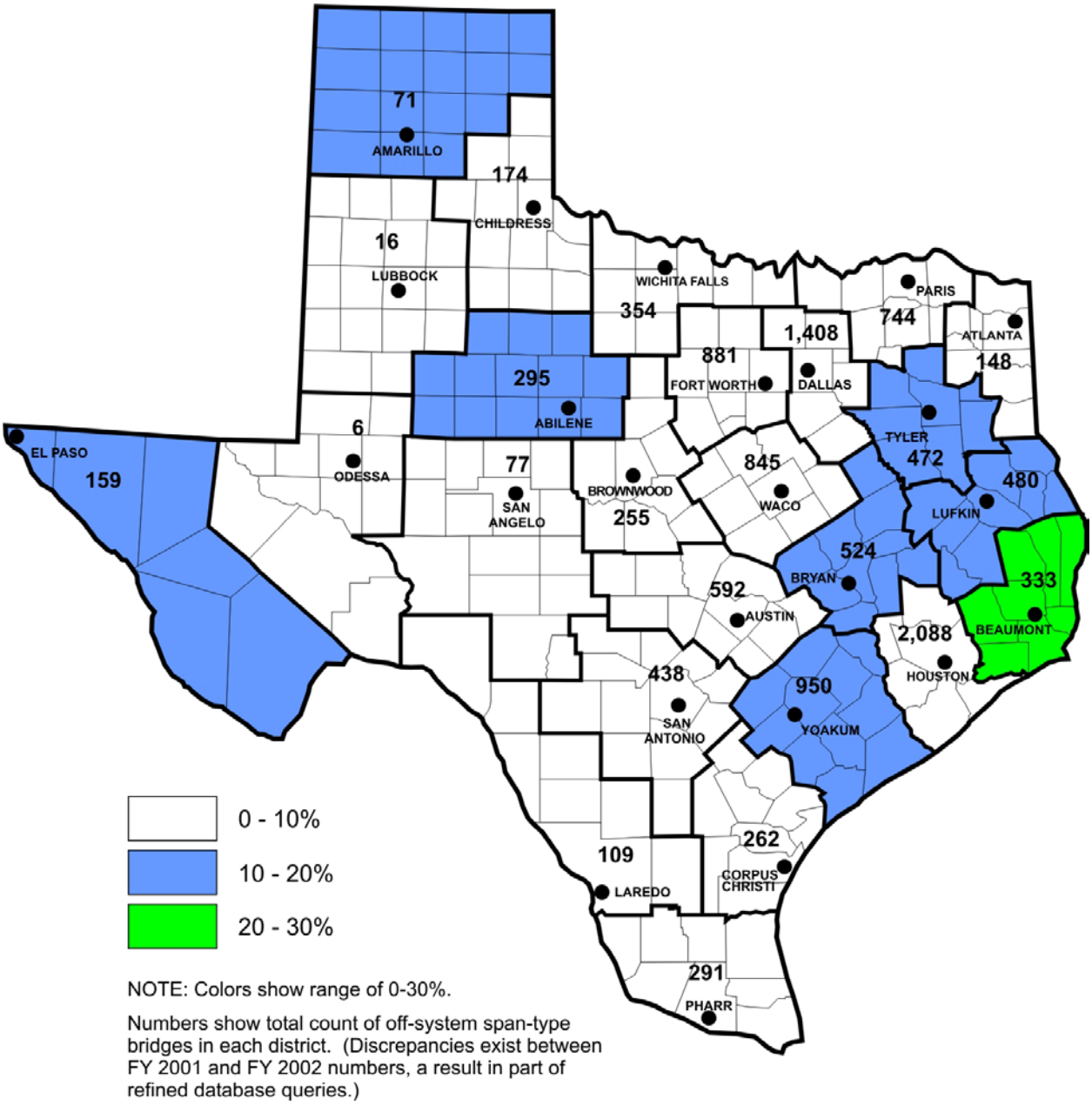
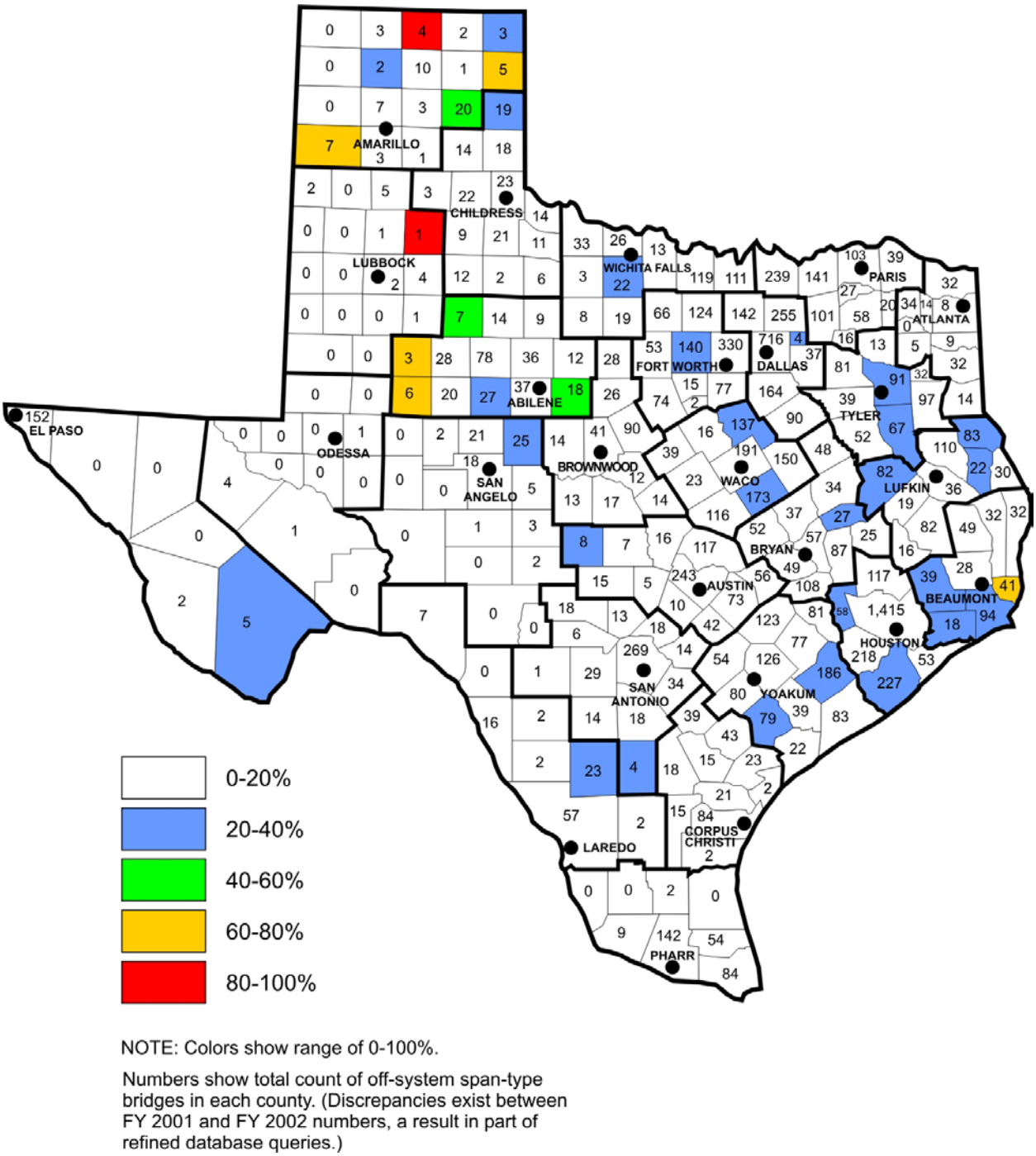


Figure 4-16. Percent of Sub-standard-for-Load-Only Off-system Span-type Bridge Deck Area in September 2002 by District

The following figure shows the distribution by county based on deck area of off-system span-type bridges that are sub-standard for load only.



NOTE: Colors show range of 0-100%.

Numbers show total count of off-system span-type bridges in each county. (Discrepancies exist between FY 2001 and FY 2002 numbers, a result in part of refined database queries.)

Figure 4-17. Percent of Sub-standard-for-Load-Only Off-system Span-type Bridge Deck Area in September 2002 by County

See Appendix A for information on sub-standard-for-load-only off-system span-type bridges in Texas counties.

Change in Condition of Span-type Bridges during FY 2002. As shown in Table 3-6, during FY 2002 the number of sufficient span-type bridges increased by 210—43 additional sufficient on-system bridges and 167 additional sufficient off-system bridges.

As shown in Table 3-7, during FY 2002 the number of non-sufficient span-type bridges decreased by 212—24 more non-sufficient on-system span-type bridges and 236 fewer non-sufficient off-system span-type bridges. The following figure breaks down this change in the condition of non-sufficiency by count in FY 2002.

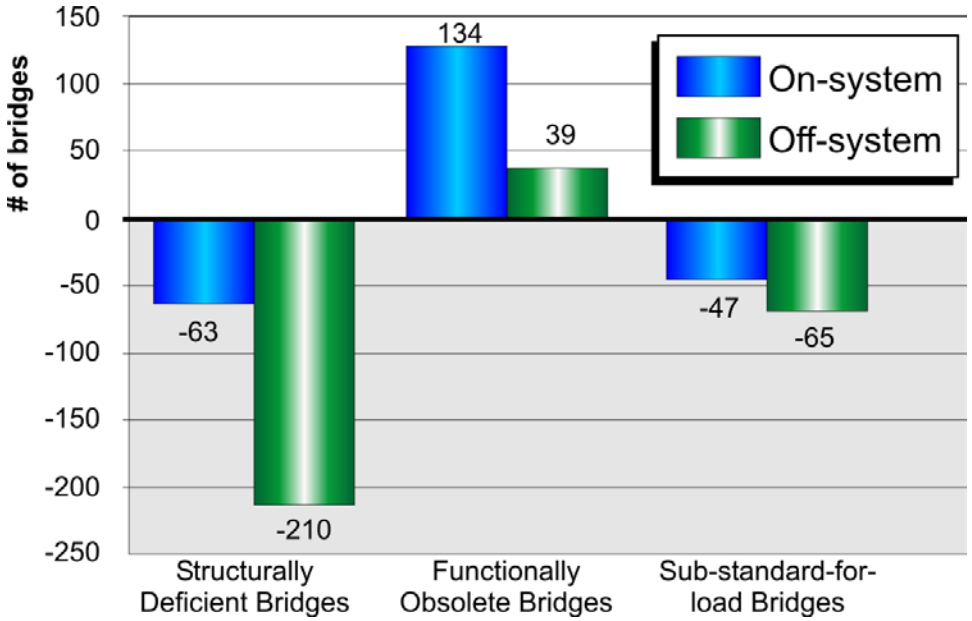


Figure 4-18. Change in Condition of Span-type Bridges by Count – September 2001 to September 2002

As shown in the following table, during FY 2002 sufficient bridge deck area increased by 4,410,684 sq. ft.—3,965,509 sq. ft. on-system and 445,175 sq. ft. off-system.

Table 4-13. Change in Condition of Sufficient Span-type Bridge Deck Area

Condition	September 2001	September 2002	Change
Sufficient On-system Span-type Bridge Deck Area	206,348,068 sq. ft.	210,313,577 sq. ft.	+ 3,965,509 sq. ft.
Sufficient Off-system Bridge Deck Area	19,371,659 sq. ft.	19,816,834 sq. ft.	+ 445,175 sq. ft.
All Sufficient Bridge Deck Area	**225,719,727 sq. ft.**	**230,130,411 sq. ft.**	**+ 4,410,684 sq. ft.**

However, 1,047,653 sq. ft. of non-sufficient span-bridge deck area was added to the bridge inventory in FY 2002, as shown in Table 4-14—431,681 sq. ft. on-system and 615,972 sq. ft. off-system. The following figure summarizes change in the condition of non-sufficient bridge deck area from September 2001 to September 2002. Most of the additional non-sufficient bridge deck area was on functionally obsolete bridges.

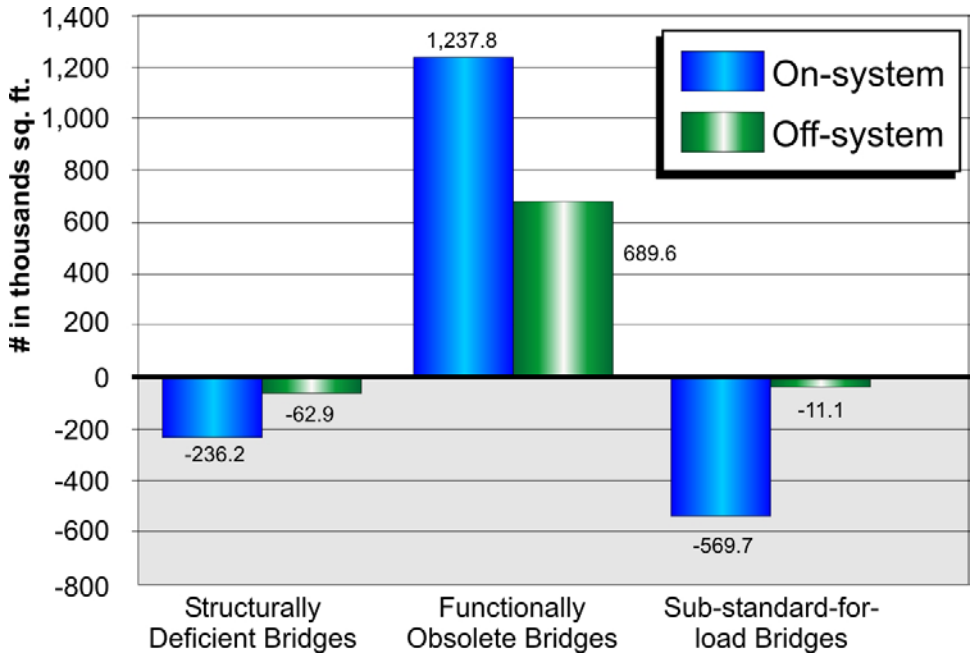


Figure 4-19. Change in Condition of Span-type Bridges by Deck Area – September 2001 to September 2002

The following table shows in more detail the change in condition of non-sufficient bridge deck area from September 2001 to September 2002.

Table 4-14. Change in Condition of Non-sufficient Span-type Bridge Deck Area

Condition		September 2001	September 2002	Change
On-system Span Bridges	Structurally Deficient	9,939,349 sq. ft.	9,703,126 sq. ft.	– 236,223 sq. ft.
	Functionally Obsolete	76,780,604 sq. ft.	78,018,216 sq. ft.	+ 1,237,612 sq. ft.
	Sub-standard for Load Only	1,436,678 sq. ft.	866,970 sq. ft.	– 569,708 sq. ft.
Off-system Span Bridges	Structurally Deficient	3,850,795 sq. ft.	3,787,927 sq. ft.	– 62,868 sq. ft.
	Functionally Obsolete	20,622,099 sq. ft.	21,311,692 sq. ft.	+ 689,593 sq. ft.
	Sub-standard for Load Only	2,049,699 sq. ft.	2,038,946 sq. ft.	– 10,753 sq. ft.
All Non-sufficient Bridge Deck Area		**114,679,224 sq. ft.**	**115,726,877 sq. ft.**	**+ 1,047,653 sq. ft.**

In FY 2002, the area of structurally deficient on-system span-type bridge decks decreased by 236,223 sq. ft., and the area of structurally deficient off-system span-type bridge decks decreased by 62,868 sq. ft. The area of functionally obsolete on-system span-type bridge decks increased by 1,237,612 sq. ft., and the area of functionally obsolete off-system span-type bridge decks increased by 689,593 sq. ft. The area of sub-standard-for-load-only on-system span-type bridge decks decreased by 569,708 sq. ft., and the area of sub-standard-for-load-only off-system span-type bridge decks decreased by 10,753 sq. ft. For both on- and off-system span-type bridges in FY 2002, increases or decreases in functionally obsolete or sub-standard-for-load-only deck area reflected increases or decreases in count.

Chapter 5 – Funding

Terms. This report uses the following terms to describe eligibility for funding of bridge projects under the Federal Highway Administration (FHWA) Highway Bridge Replacement and Rehabilitation Program (HBRRP):

- *HBRRP, Category 6-on-system bridge projects:* This is a classification of replacement or rehabilitation work on structurally deficient or functionally obsolete *on*-system bridges that have a sufficiency rating of 80 or less and are, therefore, eligible for specific funding support under the HBRRP.
- *HBRRP, Category 6-off-system bridge projects:* This is a classification of replacement or rehabilitation work on structurally deficient or functionally obsolete *off*-system bridges that have a sufficiency rating of 80 or less and are, therefore, eligible for specific funding support under the HBRRP.
- *Programmed project:* A programmed project is a bridge project that has been identified as eligible for HBRRP funding, prioritized using the Texas Eligible Bridge Selection System (TEBSS), and listed in the current Unified Transportation Program (UTP) as being authorized for letting to contract construction. Programmed projects are scheduled for letting of construction bids for a specific fiscal year.
- *Sufficiency rating:* This is a numerical evaluation of a bridge's structural adequacy and safety, serviceability and functional obsolescence, and essentiality for traffic service. The higher the number the more sufficient the bridge. The rating is used to determine whether a bridge project is eligible for HBRRP rehabilitation or replacement. A sufficiency rating of 80 or less is required to qualify for rehabilitation, and a sufficiency rating of less than 50 is required to qualify for replacement. A structurally deficient bridge with a sufficiency rating between 50 and 80 may qualify for rehabilitation or replacement if justified by engineering or economic analysis.
- *TEBSS:* The Texas Eligible Bridge Selection System provides a formula using scores for bridge attributes to help prioritize bridge replacement and rehabilitation projects to ensure that the most needy bridges are addressed first throughout the state. A TEBSS score is a rating of 0 through 100, with the higher the number the higher the priority.

The HBRRP is administered by the Bridge Division.

HBRRP Funding. A limited amount of HBRRP funds is apportioned to the states from FHWA for the specific purpose of replacing or rehabilitating structurally deficient or functionally obsolete bridges on public highways, roads, and streets. The program applies to deficient existing structures of bridge definition and classification that carry highway vehicular traffic. HBRRP funds can be used on both on-system and off-system bridges.

TxDOT administers the HBRRP program in Texas as follows:

1. TxDOT selects bridge projects for funding according to FHWA eligibility criteria and prioritizes them using its TEBSS.
2. TxDOT authorizes the projects using its Unified Transportation Program (UTP), a ten-year plan for transportation project development.

The following tables show HBRRP projects that were programmed but not let at the end of FY 2002. (Note that bridge projects may include more than one bridge.)

Table 5-1. HBRRP Projects with Funding Allocated as of September 2002

Program Period	On-system Projects	Off-system Projects	Total
2002-2005	304	852	1,156

Table 5-2. HBRRP Funds Allocated for Projects as of September 2002

Program Period	On-system Programmed Amount	Off-system Programmed Amount	Total
2002-2005	$626.23 M	$226.03 M	$852.26 M

On-system Bridge Projects Authorized to Be Let for Construction Bids. TxDOT authorized the following classes of on-system bridge projects to be let in FY 2002:

- HBRRP-funded projects (Category 6-on-system)
- Replacement and rehabilitation projects not funded under HBRRP (that is, these bridges are not necessarily structurally deficient or functionally obsolete, and the projects are funded under another funding category)
- New-location bridge projects

The following table shows HBRRP on-system bridge projects authorized to be let in Texas districts in FY 2002. Overall as well as in most districts, fewer on-system bridge projects were authorized to be let in 2002 than in 2001.

Table 5-3. On-System HBRRP Projects Authorized to Be Let, by District

District	Projects Programmed		District	Projects Programmed	
	2001	2002		2001	2002
Abilene	3	1	Laredo	1	0
Amarillo	8	0	Lubbock	0	0
Atlanta	3	9	Lufkin	11	5
Austin	17	3	Odessa	0	0
Beaumont	2	0	Paris	15	10
Brownwood	0	0	Pharr	15	0
Bryan	0	0	San Angelo	0	0
Childress	0	2	San Antonio	0	2
Corpus Christi	5	1	Tyler	8	6
Dallas	20	9	Waco	0	5
El Paso	1	0	Wichita Falls	6	4
Fort Worth	4	11	Yoakum	0	2
Houston	10	2	**Total**	**129**	**72**

Off-System Bridge Projects Authorized to Be Let for Construction Bids. The following classes of off-system bridge projects were funded in FY 2002:

- HBRRP-funded project (Category 6-off-system)
- Replacement and rehabilitation projects not funded under HBRRP (that is, these bridges are not necessarily structurally deficient or functionally obsolete)
- New-location bridge projects

The following table shows HBRRP off-system bridge projects programmed in Texas districts in FY 2002. Overall and in most districts, fewer off-system bridge projects were programmed in 2002 than in 2001.

Table 5-4. Off-System HBRRP Projects Authorized to Be Let, by District

District	Projects Programmed		District	Projects Programmed	
	2001	2002		2001	2002
Abilene	36	6	Laredo	6	3
Amarillo	2	2	Lubbock	0	0
Atlanta	2	0	Lufkin	11	6
Austin	8	19	Odessa	0	0
Beaumont	6	5	Paris	31	7
Brownwood	10	13	Pharr	10	6
Bryan	12	7	San Angelo	2	5
Childress	13	5	San Antonio	10	0
Corpus Christi	3	1	Tyler	6	1
Dallas	34	6	Waco	4	12
El Paso	2	0	Wichita Falls	23	16
Fort Worth	33	10	Yoakum	6	13
Houston	19	2	**Total**	**289**	**145**

PWP/EMP Option. In 2000, TxDOT initiated its Participation-Waived Project/Equivalent-Match Project (PWP/EMP) program to allow a local government to waive its 10% cost participation requirement in an HBRRP off-system bridge project if it agrees to use an equivalent dollar amount to improve other deficient structures in its jurisdiction.[10] In addition to HBRRP-programmed bridges, EMP work may be performed on bridge structures that are not part of the National Bridge Inventory.

The PWP/EMP program is administered by the Bridge Division.

Other Funding Resources for Off-system Bridge Work. Texas provides additional resources for local governments to facilitate improvement of off-system bridges, and those resources include the following:

- The State Infrastructure Bank (SIB) is a revolving account in the State Highway Fund from which TxDOT may award loans to local governments to fund eligible transportation projects. More information on the SIB is available at http://www.dot.state.tx.us/revexp/sib/sibtoc.htm.
- TxDOT's Economically Disadvantaged Counties (EDC) Program allows TxDOT to adjust a county's matching funds requirements after evaluating the local government's ability to meet the requirement. TxDOT also allows a county participating in the EDC program to use its adjusted participation amount in lieu of all or part of its 10% cost participation in the PWP/EMP program. More information on this program is available in Chapter 4 of TxDOT's *Transportation Planning Manual* at http://manuals.dot.state.tx.us/dynaweb/coltrsys/pln.
- Counties are beginning to explore bridge funding through Regional Mobility Authorities (RMAs) for toll facilities. More information on RMAs is available on the TxDOT internet site at http://www.dot.state.tx.us/dtf/DraftingtheFuture.pdf.

[10] A November 2001 amendment extended the safety-improvement types of work that can be classified as EMP projects and allowed local governments to perform EMP work in geographically adjacent governmental units.

Chapter 6 – Letting for Construction Bids

Terms. This report uses the following terms to describe letting of bridge projects:

- *Let project:* A let project is one that has been programmed and one for which TxDOT has solicited sealed bids from contractors for work on a highway project and has awarded a contract.
- *National Bridge Inventory (NBI):* The NBI is a database of information supplied by the states and maintained by the FHWA about bridges located on public roads.
- *New-location bridges:* These are bridges built in a location where a bridge did not previously exist.

On-system Bridge Projects Let for Construction Bids in FY 2002. The following table shows on-system bridges in HBRRP projects let in Texas districts in FY 2002. Overall, more on-system bridge projects were let in 2002 than in 2001.

Table 6-1. On-system Bridges in HBRRP Projects Let, by District

District	Bridge Projects		District	Bridge Projects	
	2001	2002		2001	2002
Abilene	1	1	Laredo	1	0
Amarillo	1	6	Lubbock	0	0
Atlanta	2	11	Lufkin	8	1
Austin	4	7	Odessa	2	0
Beaumont	0	0	Paris	6	15
Brownwood	0	0	Pharr	13	0
Bryan	0	2	San Angelo	0	0
Childress	0	1	San Antonio	0	2
Corpus Christi	2	1	Tyler	5	9
Dallas	1	7	Waco	0	5
El Paso	0	0	Wichita Falls	6	2
Fort Worth	3	8	Yoakum	0	0
Houston	7	1	**Total**	**62**	**79**

The following table shows on-system bridges in non-HBRRP bridge projects let in Texas districts in FY 2001 and FY 2002.

Table 6-2. On-system Bridges in Non-HBRRP Projects Let by District

District	2001		2002	
	New-location Bridges	Non-HBRRP Repl./Rehab.	New-location Bridges	Non-HBRRP Repl./Rehab.
Abilene	5	19	4	6
Amarillo	0	4	2	3
Atlanta	0	4	4	7
Austin	13	5	10	5
Beaumont	3	7	0	2
Brownwood	0	4	1	1
Bryan	4	5	1	1
Childress	0	4	0	7
Corpus Christi	16	18	8	5
Dallas	44	23	10	24
El Paso	6	0	5	0
Fort Worth	15	4	5	5
Houston	31	11	38	21
Laredo	0	9	0	5
Lubbock	0	5	0	1
Lufkin	2	0	3	3
Odessa	1	1	0	0
Paris	12	1	3	10
Pharr	16	18	18	13
San Angelo	6	3	11	26
San Antonio	12	12	26	12
Tyler	1	1	1	8
Waco	1	11	1	8
Wichita Falls	7	2	0	0
Yoakum	15	16	12	13
Total	**210**	**187**	**163**	**186**

The following table shows the condition of on-system bridges that had replacement or rehabilitation projects let for construction bids in FY 2002.

Table 6-3. On-system Bridges in Replacement and Rehabilitation Projects Let in FY 2002

Condition	HBRRP Funded	Non-HBRRP Funded	Total No. of Repl./Rehab. Bridges	Percent of Repl./Rehab. Bridges
Structurally Deficient	57	9	66	25%
Functionally Obsolete	22	29	51	19%
Not Structurally Deficient or Functionally Obsolete	0	148	148	56%
Total	**79**	**186**	**265**	**100%**

The following table shows funding levels and the number of on-system bridges in projects let in FY 2002.

Table 6-4. All On-system Bridges in Bridge Projects Let in FY 2002

	HBRRP-funded		Non-HBRRP Repl./Rehab.		New-location		Total
		% of Total		% of Total		% of Total	
Funding for Bridge Projects Let	$84.3 M	15%	$153.7 M	28%	$317.4 M	57%	$555.4 M
Number of Bridges in Projects Let	79	18.5%	186	43.5%	163	38%	428
Number of Bridge Projects Let	70	30%	97	42%	64	28%	231

For on-system bridge construction in FY 2002—which included rehabilitation, replacement, and new-location bridges, 38% of the bridges addressed (down from 46% in FY 2001) were new-location bridges. Of the money spent on bridge construction in FY 2002, 57% (down from 69% in FY 2001) was used for new-location bridges.

Off-system Bridge Projects Let for Construction Bids in FY 2002. The following table shows off-system bridges in projects let in Texas districts in FY 2001 and FY 2002. Overall, more off-system bridge projects were let in 2001 than in 2002.

Table 6-5. Off-system Bridges in HBRRP Projects Let, by District

District	Bridges		District	Bridges	
	2001	2002		2001	2002
Abilene	5	13	Laredo	3	0
Amarillo	1	3	Lubbock	0	0
Atlanta	2	0	Lufkin	8	1
Austin	7	1	Odessa	0	0
Beaumont	0	2	Paris	0	26
Brownwood	6	13	Pharr	5	1
Bryan	6	6	San Angelo	0	0
Childress	11	5	San Antonio	1	3
Corpus Christi	1	0	Tyler	7	1
Dallas	4	0	Waco	4	10
El Paso	1	0	Wichita Falls	23	9
Fort Worth	20	19	Yoakum	8	11
Houston	8	1	**Total**	**131**	**125**

The following table shows off-system bridges in non-HBRRP bridge projects let in Texas districts in FY 2002. Except for the HBRRP, TxDOT has limited authority to fund locally owned bridge projects.

Table 6-6. Off-system Bridges in Non-HBRRP Projects Let, by District

District	2001		2002	
	New-location Bridges	Non-HBRRP Repl./Rehab.	New-location Bridges	Non-HBRRP Repl./Rehab.
Abilene	0	0	0	0
Amarillo	0	0	0	0
Atlanta	0	0	0	0
Austin	0	0	0	0
Beaumont	0	0	0	0
Brownwood	0	0	0	0
Bryan	0	0	0	0
Childress	0	0	0	0
Corpus Christi	0	0	0	0
Dallas	0	0	0	0
El Paso	2	1	5	0
Fort Worth	2	1	1	0
Houston	5	1	2	0
Laredo	0	1	0	0
Lubbock	0	0	0	0
Lufkin	0	0	0	0
Odessa	1	0	0	0
Paris	2	0	0	1
Pharr	0	0	0	0
San Angelo	0	0	0	0
San Antonio	0	1	2	2
Tyler	0	0	0	0
Waco	0	0	4	0
Wichita Falls	0	0	0	0
Yoakum	0	0	0	0
Total	**12**	**5**	**14**	**3**

The following table shows the condition of off-system bridges that had replacement or rehabilitation projects let for construction bids in FY 2002.

Table 6-7. Off-system Bridges in Replacement and Rehabilitation Projects Let in FY 2002

Condition	HBRRP Funded	Non-HBRRP Funded	Total No. of Repl./Rehab. Bridges	Percent of Repl./Rehab. Bridges
Structurally Deficient	113	1	114	89%
Functionally Obsolete	12	2	14	11%
Not Structurally Deficient or Functionally Obsolete	0	0	0	0%
Total	**125**	**3**	**128**	**100%**

The following table shows funding levels and the number of all bridges in projects let in FY 2002.

Table 6-8. All Off-system Bridges in Projects Let in FY 2002

	HBRRP-funded		Non-HBRRP Repl./Rehab.		New-location		Total
		% of Total		% of Total		% of Total	
Funding for Bridge Projects Let	$28.6 M	71%	$0.61 M	2%	$11.0 M	27%	$40.3 M
Number of Bridges in Projects Let	125	88%	3	2%	14	10%	142
Number of Bridge Projects Let	123	89%	2	1%	14	10%	139

On-system Bridge Maintenance Projects Let for Bids in FY 2002. In FY 2002, maintenance (including preventive maintenance) funds for on-system bridges came from two sources:

- Statewide Maintenance Budget—In FY 2002, 2.3% of the $722.8 M budget—down from 2.8% in FY 2001—funded bridge maintenance. The Statewide Maintenance Budget is administered by TxDOT's Maintenance Division.
- Construction Letting Volume—In FY 2002, 1.5% of the $2.71 B construction letting—up from 1.2% in FY 2001—funded bridge maintenance.

Summary of FY 2002 Funds Spent on On-system Bridges. The following figure shows the distribution of money spent in FY 2002 for on-system bridge maintenance, bridge replacement and rehabilitation, and construction of new-location bridges.

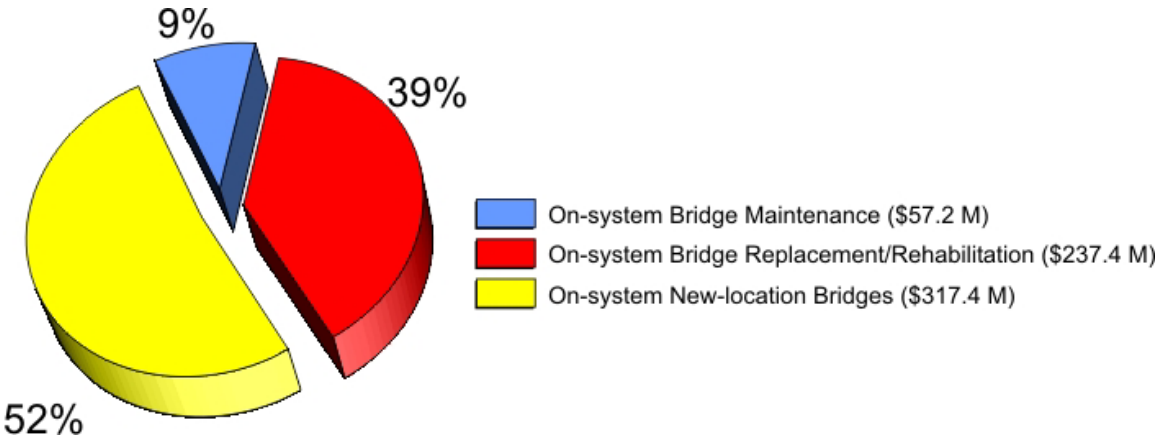


Figure 6-1. Distribution of Funds Spent on On-system Bridges in FY 2002 ($612 M Total)

FY 2002 PWP/EMP Option. TxDOT's Participation-Waived Project/Equivalent-Match Project (PWP/EMP) program was initiated by TxDOT in FY 2001. The program allows a local government to waive its 10% cost participation requirement in an off-system bridge project if it agrees to use an equivalent dollar amount to improve other deficient structures in its jurisdiction. The project on which the local participation requirement is waived is referred to as the

participation-waived project (PWP), and the project(s) to be performed by the local government in return for the participation waiver is referred to as the equivalent-match project(s) (EMP).

The following table shows PWP/EMP activity in FY 2002 by TxDOT district.

Table 6-9. PWP/EMP Projects in FY 2002 by District

Districts	Number of PWP Agreements Executed	Number of EMP Projects	Number of NBI EMP Projects	Dollars Waived for PWP Projects	Number of PWP Projects Let
Abilene	10	14	10	$200,190	4
Amarillo	3	22	17	$780,475	2
Atlanta	1	1	0	$18,020	0
Austin	22	31	5	$701,711	1
Beaumont	1	6	0	$61,734	1
Brownwood	14	79	0	$322,560	13
Bryan	15	17	11	$368,744	1
Childress	12	30	3	$148,830	1
Corpus Christi	17	8	5	$370,528	0
Dallas	17	7	6	$360,932	0
El Paso	0	0	0	0	0
Fort Worth	33	34	32	$1,124,135	7
Houston	2	2	1	$114,950	0
Laredo	0	0	0	0	0
Lubbock	0	0	0	0	0
Lufkin	6	10	3	$80,165	0
Odessa	0	0	0	0	0
Paris	26	36	15	$437,251	10
Pharr	4	2	2	$36,137	0
San Angelo	1	1	1	$56,385	0
San Antonio	4	10	1	$356,875	2
Tyler	5	12	12	$248,457	0
Waco	14	40	26	$699,496	5
Wichita Falls	21	30	1	$290,548	6
Yoakum	14	26	5	$382,709	6
Total	**242**	**418**	**156**	**$7,160,832**	**59**

See Appendix B for the FY 2002 PWP/EMP Annual Report, which includes outcomes of the program since it was initiated in 2001.

Chapter 7 – Bridge Needs

Goals. In August 2001, TxDOT adopted a goal that within ten years at least 80% of the bridges in Texas would be in good or better condition. Additionally, TxDOT has adopted a goal to accelerate the upgrade of all structurally deficient on-system bridges, prioritizing critically deficient bridges, to eliminate all structurally deficient on-system bridges.

To achieve these goals, TxDOT must improve all existing structurally deficient on-system bridges, improve the other bridges that are currently non-sufficient, and plan improvement of bridges that will become non-sufficient within this goal period.

This report classifies Texas bridges as sufficient (meeting minimum requirements) and non-sufficient, with non-sufficient bridges further classified as structurally deficient, functionally obsolete, or sub-standard for load only:

- Classifications of structurally deficient and functionally obsolete are based on National Bridge Inspection Standards (NBIS) criteria.
- States vary in the loads they allow on bridges, and bridges that fail to meet Texas load limits and are not structurally deficient or functionally obsolete are classified as sub-standard for load only. A sub-standard-for-load-only structure is load-posted or recommended for load-posting.
- Bridges not structurally deficient, functionally obsolete, or sub-standard for load only are classified as sufficient.

Condition of Existing Bridges. Of Texas' 48,216 bridges, 34,174 bridges—70.9%—were sufficient in September 2002, as detailed in the following table:

Table 7-1. Sufficient Bridges

Bridge Type	Number of Sufficient Bridges		% of Total Number of Bridge Type	
	2001	2002	2001	2002
On-system Span-type Bridges	13,756	13,799	72.8%	72.8%
On-system Bridge-class Culverts	12,350	12,344	94.7%	94.5%
Off-system Span-type Bridges	4,324	4,491	35.9%	37.5%
Off-system Bridge-class Culverts	3,379	3,540	82.1%	83.6%

Of all on-system bridges in September 2002, 81.7% were sufficient, and 49.6% of all off-system bridges were sufficient.

For Texas' 30,918 span-type bridges, evaluation of condition based on count varies somewhat from evaluation of condition based on deck area, as shown in the following table.

Table 7-2. Condition of Span-type Bridges

Condition		% Based on Count		% Based on Deck Area	
		2001	2002	2001	2002
Sufficient		58.5%	59.2%	66.2%	66.6%
Non-sufficient	Structurally Deficient	9.9%	9.0%	4.0%	3.9%
	Functionally Obsolete	26.0%	26.5%	28.6%	28.7%
	Sub-standard for Load Only	5.5%	5.1%	1.0%	0.8%

Changes in FY 2002. The total number of Texas bridges increased by 296 during FY 2001 and by another 132 during FY 2002, as shown in Table 2-1, for a total increase of 428 bridges. As shown in Table 3-6, the total number of sufficient bridges increased by 403 during FY 2001 and by another 367 during FY 2002, a total of 770, in large part because of the 428 new-location bridges.

The following table summarizes change in the condition of non-sufficient bridges, detailed in Table 3-7.

Table 7-3. Overall Change in Condition of Non-sufficient Bridges by Count

Condition	September 2000	September 2001	September 2002	Change During FY 2001	Change During FY 2002
Structurally Deficient	3,394	3,196	2,928	– 198	– 268
Functionally Obsolete	9,045	9,206	9,392	+ 161	+ 186
Sub-standard for Load Only	1,816	1,790	1,654	– 26	– 136

Two programs particularly helped improve Texas bridges in FY 2002:

- Highway Bridge Replacement and Rehabilitation Program (HBRRP)—TxDOT administers this Federal Highway Administration (FHWA) program, using its Texas Eligible Bridge Selection System (TEBSS) to select and prioritize bridge projects for program funding. TEBSS ensures that bridges in the worst condition have the highest priority for HBRRP funding. As shown in Tables 6-3 and 6-7, in FY 2002 federally funded HBRRP projects let to construction 170 structurally deficient bridges (57 on-system and 113 off-system) and 34 functionally obsolete bridges (22 on-system and 12 off-system), for a total of 204 bridges. In FY 2002 federally funded HBRRP projects let to construction 24 more structurally deficient bridges and 12 fewer functionally obsolete bridges, a total of 12 more bridges, than in FY 2001.
- TxDOT's Participation-Waived Project/Equivalent-Match-Project (PWP/EMP) option allows a local government to waive its required 10% cost participation in an off-system bridge project if it agrees to use an equivalent dollar amount to improve other deficient structures in its jurisdiction. As shown in Table 6-9, the PWP/EMP program supported work on 59 participation-waived structurally deficient or functionally obsolete off-system bridge projects that went to letting in FY 2002. Additional agreements with local governments that were not let for construction bids in FY 2002 were executed during the year to address another 183 participation-waived structurally deficient or functionally obsolete off-system bridge projects

in the future. In addition, a total of 156 equivalent-match projects involving bridges that are on the National Bridge Inventory will be improved by local governments.

In September 2000, 33,406 of Texas' 47,788 bridges—69.9%—were sufficient. As of September 2001, the starting point for the ten-year goal, 33,809 of Texas 48,084 bridges—70.3%—were sufficient. In September 2002, 34,174 of Texas 48,216 bridges—70.9%, 0.6% more than in September 2001—were sufficient. Among on-system bridges 81.7% were sufficient, 0.1% less than the 81.8% of the previous year. However, among off-system bridges, only 49.6% were sufficient, 1.9% more than the 47.7% of the previous year, primarily because of non-sufficient off-system span-type bridges.

As shown in Tables 6-3 and 6-7, during FY 2002 in all funding categories TxDOT let to construction work to upgrade to sufficient the condition of 66 on-system structurally deficient bridges, up 22 from the previous year, and 114 off-system structurally deficient bridges, up 2 from the previous year. TxDOT also let to construction work to upgrade to sufficient the condition of 51 on-system functionally obsolete bridges, down 3 from the previous year, and 14 off-system functionally obsolete bridges, down 7 from the previous year.

As shown in Table 3-7, during FY 2002 the number of on-system structurally deficient span-type bridges decreased by 63, and the number of off-system structurally deficient span-type bridges decreased by 210. The number of structurally deficient on-system culverts decreased by 7, but the number of structurally deficient off-system culverts increased by 12. As shown in Figures 4-3 and 4-5, in September 2002 most of the structurally deficient span-type bridges were off-system: 622 on-system and 2,161 off-system. However, as shown in Tables 4-2 and 4-4, most of the structurally deficient deck area was on-system: 9,703,126 sq. ft. on-system and 3,787,927 sq. ft. off-system.

As shown in Table 3-7, during FY 2002 the number of on-system functionally obsolete span-type bridges increased by 134, and the number of off-system functionally obsolete span-type bridges increased by 39. The number of functionally obsolete on-system culverts increased by 60, but the number of functionally obsolete off-system culverts decreased by 47. As shown in Figures 4-3 and 4-5, in September 2002 most of the functionally obsolete span-type bridges were on-system: 4,317 on-system and 3,883 off-system. As shown in Tables 4-6 and 4-8, most of the functionally obsolete deck area was also on-system: 78,018,216 sq. ft. on-system and 21,311,692 sq. ft. off-system.

As shown in Table 3-7, during FY 2002 the number of on-system sub-standard-for-load-only span-type bridges decreased by 47, and the number of off-system sub-standard-for-load-only span-type bridges decreased by 65. The number of sub-standard-for-load-only on-system culverts decreased by 22, and the number of sub-standard-for-load-only off-system culverts decreased by 2. As shown in Figures 4-3 and 4-5, in September 2002 most of the sub-standard-for-load-only span-type bridges were off-system: 190 on-system and 1,400 off-system. As shown in Tables 4-10 and 4-12, most of the sub-standard-for-load-only deck area was also off-system: 866,970 sq. ft. on-system and 2,038,946 sq. ft. off-system.

Challenges for Achieving the 80%-Sufficient-by-2011 Goal. Structurally deficient bridges present potential strength issues, functionally obsolete bridges present potential for traffic flow problems and accidents, and sub-standard-for-load-only bridges pose issues for traffic flow. Texas has an aging transportation infrastructure that includes bridges that were not designed for today's loads and volume of traffic. Traffic volumes are increasing, and trucks are heavier today than many bridges were designed to support. This report tracks annual progress toward the ten-year goal to make at least 80% of Texas bridges good or better by September 2011.

Table 7-4. Bridges that Must Be Improved to Reach the 80%-Sufficient-by-2011 Goal

	2000	2001	2002
Total Bridges	47,788	48,084	48,216
Total Sufficient Bridges	33,406	33,809	34,174
Percent Sufficient Bridges	69.9%	70.3%	70.9%
Total Non-sufficient Bridges*	14,255	14,192	13,974
Percent Non-sufficient Bridges	29.8%	29.5%	29.0%
Net Number of Bridges Improved (not New-location Bridges) during Year	NA	107	233
No. of Bridges/Year to be Improved to Reach 80%-Sufficient-by-2011 Goal	439	466	489
* A few bridges are not classified by condition. In September 2001, bridge records included 83 bridges not classified by condition. In September 2002, bridge records included 68 bridges not classified by condition.			

In September 2000, Texas had 47,788 bridges, and 33,406 (69.9%) of them were sufficient. If the bridge inventory had remained stable—and it actually increased by 296 bridges in FY 2001—TxDOT would have had to decrease its inventory of non-sufficient bridges by 4,825—approximately 439 bridges per year—to reach a goal of at least 80% sufficient bridges by 2011. Although TxDOT increased the total number of sufficient bridges by 403 between September 2000 and September 2001, 296 of those bridges were new-location bridges. In other words, in FY 2001, the year preceding TxDOT's initiative to reach a goal of at least 80% sufficient bridges within ten years, the number of non-sufficient bridges actually decreased by only 107 rather than the decrease of 439 required to meet the goal.

In September 2001, Texas had 48,084 bridges, and 33,809 (70.3%) of them were sufficient. If the bridge inventory had remained the same for the next ten years—and it actually increased by 132 bridges in FY 2002, TxDOT would have had to decrease its inventory of non-sufficient bridges by 4,659—approximately 466 bridges per year—to reach Commissioner Johnson's ten-year goal.[11] During FY 2002, the number of non-sufficient non-new-location bridges actually decreased by 233 rather than the decrease of 466 required to meet the goal.

As shown in Table 7-4, in September 2002, Texas had 48,216 bridges: 34,174 (70.9%) of them were sufficient and 13,974 of them were non-sufficient, with the remainder not classified by condition. If the bridge inventory were to remain stable, TxDOT would have to decrease its inventory of non-sufficient bridges by 4,399—approximately 489 bridges per year—to reach its goal of at least 80% sufficient bridges within the next nine years.

[11] Texas Transportation Commission's Transportation Working Group, "Texas Transportation Partnerships: Connecting You to the World," August 2001.

Challenges for Eliminating All Structurally Deficient On-system Bridges. In September 2000, Texas had 758 structurally deficient on-system bridges. During FY 2001 the inventory of structurally deficient on-system bridges actually increased by 5, and as shown in Tables 3-2 and 3-3, in September 2001 Texas had 763 structurally deficient on-system bridges. During FY 2002 the inventory of structurally deficient on-system bridges decreased by 70, and in September 2002, Texas had 693 structurally deficient on-system bridges.

Non-sufficient Bridges in FY 2002. Analysis of the condition of Texas bridges during FY 2002 clarifies the challenges for achieving TxDOT's bridge goals.

Structurally Deficient Bridges. During FY 2002, TxDOT let to contract work on 66 on-system structurally deficient bridges[12], as shown in Table 6-3; during that time the total number of all on-system structurally deficient bridges decreased by 70, as shown in Table 3-7. During FY 2002, TxDOT let to contract work on 114 off-system structurally deficient bridges, as shown in Table 6-7, and during that time the total number of all off-system structurally deficient bridges decreased by 198, as shown in Table 3-7.

In FY 2002 the number of structurally deficient on-system span-type bridges decreased by 63, as shown in Table 3-7. The number of structurally deficient on-system bridge-class culverts decreased by 7.

In FY 2002 the number of structurally deficient off-system span-type bridges decreased by 210, but the number of structurally deficient off-system bridge-class culverts increased by 12, as shown in Table 3-7. However, 18.1% of all off-system span type bridges were still structurally deficient in September 2002, as shown in Table 4-3, down from 19.7% in September 2002.

Functionally Obsolete Bridges. During FY 2002, TxDOT let to contract work on 51 on-system functionally obsolete bridges[13], as shown in Table 6-3. However, during that time the total number of all on-system functionally obsolete bridges increased by 194, as shown in Table 3-7. During FY 2002, TxDOT let to contract 14 off-system functionally obsolete bridges, as shown in Table 6-7. During that time the total number of all off-system functionally obsolete bridges decreased by 8, as shown in Table 3-7.

In September 2002, 15% of all on-system bridges and 27% of all off-system bridges were functionally obsolete, as shown in Figures 3-3 and 3-4. These proportions are higher for span-type bridges: 23% of all on-system span-type bridges and 32% of all off-system span-type bridges were functionally obsolete in September 2002, as shown in Figures 4-3 and 4-5. These proportions did not change significantly from September 2000 although the total number of functionally obsolete bridges has increased by 347 (161 in FY 2001 and 186 in FY 2002) and the total number of functionally obsolete span-type bridges has increased by 294 (121 in FY 2001 and 173 in FY 2002), as shown in Table 3-7.

[12] Many bridges let to contract in FY 2002 were under construction in September 2002, and their improved sufficiency will not be reflected in the Bridge Inspection database until after construction on them is complete.
[13] Many bridges let to contract in FY 2002 were under construction in September 2002, and their improved sufficiency will not be reflected in the Bridge Inspection database until after construction on them is complete.

Sub-standard-for-Load-Only Bridges. As shown in Table 3-7, in September 2002 Texas had 1,654 sub-standard-for-load-only bridges, and nearly 85% of them were off-system span-type bridges. Although the number of sub-standard-for-load-only off-system span-type bridges decreased in FY 2002 from 1,465 to 1,400, at the end of the year 12% of all off-system span-type bridges were still sub-standard for load only, as shown in Figure 4-5.

Resources Needed. TxDOT is using a number of funding categories in addition to the HBRRP and PWP/EMP programs to facilitate improvement of these bridges, and TxDOT and local governments must work more effectively to improve these bridges in the coming years. TxDOT's Economically Disadvantaged Counties Program and State Infrastructure Bank (SIB) also provide resources for local governments trying to improve their off-system bridges.

Of TxDOT funds spent on bridges in FY 2002, 48% (up from 37% in FY 2001) were distributed for bridge maintenance, rehabilitation, and replacement, with remaining funds going for construction of new-location bridges.

Assessments of condition by count (number of bridges) focus on the number of locations where bridges pose structural issues and potential for traffic disruption. By count, more off-system bridges require attention to address structural deficiencies than do on-system bridges. Assessments of condition by deck area, however, provide a clearer view of funding needed to address structural deficiencies. Over two and a half times more structurally deficient deck area for on-system bridges requires attention than for off-system bridges, as shown by Tables 4-2 and 4-4.

Access to information about Texas bridges is essential for effective planning and monitoring. TxDOT is developing an automated system to facilitate the management of on- and off-system bridges. The Bridge Management Information System (BMIS), which will be based on AASHTO's bridge management software, Pontis, will allow TxDOT to store and process bridge inspection data, bridge photographs, bridge reports, and other bridge information in a relational database. Information retrieval will be possible in a variety of textual and graphical formats. The retrieved information will facilitate assessment of implications of project decisions, understanding impact of alternative bridge management strategies, forecasting preventive maintenance, and evaluation of bridge performance over time. Information retrieval will be quick, and retrieved information will be easily shared and available in user-friendly formats. This system is much needed, and it will greatly increase efficiency of bridge administration. This system is especially necessary to allow tracking of the condition of Texas bridges at a level of detail and frequency required to facilitate prioritization of funding to surmount challenges inherent in meeting the goals for improving Texas bridges.

Chapter 8 – Meeting the Challenges

Priorities. To meet its goals to have at least 80% of Texas bridges in good or better condition by August 2011 and to eliminate all structurally deficient on-system bridges, TxDOT is working to improve non-sufficient bridges to sufficient status. TxDOT's primary focus is on accelerating the upgrade of all structurally deficient on-system bridges, prioritizing critically deficient bridges[14], in an effort to eliminate all structurally deficient on-system bridges.

In September 2002, Texas had 693 structurally deficient on-system bridges, as shown in Figure 3-3 and Table 3-7, in contrast with 763 in September 2001. TxDOT reduced the inventory of structurally deficient on-system bridges by 70 during FY 2002, in contrast with an increase of 5 during FY 2001.

If all structurally deficient on-system bridges have been upgraded before August 2011, Texas will still need to upgrade an average additional 248 structurally deficient off-system bridges and an average additional 164 functionally obsolete and sub-standard-for-load-only bridges each year to remain on track to reach a total of at least 80% sufficient bridges by August 2011.

Current Bridge Inventory	48,216
80% of Current Bridge Inventory	38,573
Currently Sufficient Bridges	34,174
All Currently Structurally Deficient On-System Bridges	693
No. of Additional Bridges to Be Improved over 9 Years to Reach 80%-sufficient Goal	3,706
Average Number of Bridges/Year to Be Improved over 9 Years to Reach 80%-sufficient Goal	489

The number and condition of Texas bridges change constantly, affecting estimates for work needed to achieve goals. TxDOT will continue its annual assessment of work needed in the coming year to meet its goals to have no structurally deficient on-system bridges and to have at least 80% of Texas bridges in good or better condition by August 2011.

In FY 2002, $189.7M FHWA Highway Bridge Replacement and Rehabilitation Program (HBRRP) funding was apportioned for work on structurally deficient and functionally obsolete bridges (sub-standard-for-load-only bridges are not eligible for HBRRP funding). As shown in the following table, as of September 2002, $160.3M of the available funds had been obligated for use on structurally deficient and functionally obsolete bridges.

[14] Critically deficient bridges are the bridges classified as structurally deficient that are in most need of attention.

Table 8-1. HBRRP Funding Available and Used

Year	$ Apportioned for Year*	$ Obligated during Year	% Obligated during Year
FY 2001	$172.8M	$154.7M	89.5%
FY 2002	$189.7M	$160.3M	84.5%
FY 2003	$162.2M		
* Funds apportioned each year must be obligated within the following 4 years.			

Although TxDOT has always obligated all HBRRP funds within the required four years of their apportionment, in the coming years TxDOT will particularly focus on obligating all available HBRRP funds each year.

Strategy. To meet its goals to have no structurally deficient on-system bridges and to have at least 80% of Texas bridges in good or better condition by August 2011, TxDOT is following a plan for improving Texas bridges that is adjusted annually after review of the effect of the preceding year's work on progress toward the goal.

Plan. The basic steps of the plan to achieve the goals are given below:

- Develop and distribute an annual report to identify progress toward achieving the goals.
  Status: This report serves that purpose.
- Use the annual report to adjust the resources each year as needed.
  Status: Data compiled during development of the first issue of this report, *Report on Texas Bridges as of September 2001*, supported development of a new prioritization for on-system bridges, currently in early stages of development, of bridge work for the 12-month letting schedule:
  Priority 1 – Critically deficient land-locking bridges
  Priority 2 – Remaining critically deficient bridges
  Priority 3 – Structurally deficient land-locking bridges
  Priority 4 – Remaining structurally deficient bridges
  Priority 5 – Functionally obsolete land-locking bridges
  Priority 6 – Remaining functionally obsolete bridges
- Produce completed bridge plans, specifically targeting those structurally deficient on-system bridges that are critically deficient, that will be available to substitute for delayed HBRRP projects.
  Status: TxDOT's Bridge Division and districts are working together, with support from the Bridge Division bridge design consultant pool, to target these bridges for plan development.
- Produce completed bridge plans, targeting structurally deficient off-system bridges that will be available to substitute for delayed HBRRP projects.
  Status: TxDOT's Bridge Division is now working with districts to develop a backlog of projects to substitute for delayed HBRRP projects.
- Develop a process to substitute HBRRP projects for those that are delayed for letting to construction in order to contract 100 percent of HBRRP program funds on the 12-month HBRRP letting schedule each fiscal year.
  Status: HBRRP projects will begin to be scheduled in the first eight months of each fiscal year to allow sufficient time to substitute projects that are delayed to letting.

- Use other categories of funding in addition to HBRRP funds to achieve the goals.
  Status: TxDOT's Bridge Division and districts have increased emphasis on using additional categories of funding for bridge replacement and rehabilitation.
- Standardize additional bridge elements and make them available on the Internet in order to simplify design, speed construction, and lower costs.
  Status: During FY 2002, TxDOT updated existing online standard drawings and began work on standardization for two new bridge elements: concrete slab spans and box beams.
- Increase the use of cluster contracts that address two or more deficient bridges within a reasonable geographical area. This should lower overall design and construction costs.
  Status: TxDOT's Bridge Division and districts have increased emphasis on using cluster contracts.
- Use maintenance funds to address on-system bridge problems that result in low condition ratings to prevent non-structurally deficient on-system bridges from becoming structurally deficient.
  Status: As shown in Figure 6-1, TxDOT distributed $57.2 M for on-system bridge maintenance in FY 2002, compared to $57.6 M in FY 2001.

The following information is included in this annual report to assist in achieving the goals:

- The number of structurally deficient on-system bridges that must be upgraded in the coming years to remain on track for accelerating the elimination of all structurally deficient bridges.

  As of September 2002, there were 693 (in contrast with 758 in September 2001) structurally deficient on-system bridges.

- The number of structurally deficient on-system bridges and the number of functionally obsolete and sub-standard-for-load-only bridges that must be upgraded in the coming year to remain on track for reaching a total of at least 80% sufficient bridges by August 2011.

  Assuming that the bridge inventory remains stable, its condition does not further deteriorate, and all structurally deficient on-system bridges will be upgraded, as of September 2002 an average additional 248 (in contrast with 243 in September 2001) structurally deficient off-system bridges and an average additional 164 (in contrast with 147 in September 2001) functionally obsolete and sub-standard-for-load-only bridges must be upgraded each year to remain on track for reaching a total of at least 80% sufficient bridges by August 2011.

- The amount of HBRRP funding available and the amount of HBRRP funding obligated in the current year for work on structurally deficient and functionally obsolete bridges.

  See Table 8-1.

- The amount of HBRRP funding available for work on structurally deficient and functionally obsolete bridges in the coming year.

  See Table 8-1.

- Recommendations for additional funding sources as needed to accelerate the elimination of all structurally deficient on-system bridges.

  As of September 2002, not applicable.

Innovations and Best Practices in FY 2002. To facilitate use of available funding to upgrade non-sufficient bridges as efficiently as possible, TxDOT will annually review innovations and best practices of the preceding year.

The following programs made funds available or facilitated their use to upgrade non-sufficient bridges:

- Highway Bridge Replacement and Rehabilitation Program (HBRRP)—TxDOT has administered this Federal Highway Administration (FHWA) program since its beginning in 1970. Initial funding participation requirements for both on- and off-system bridges were 80% federal and 20% state or local; however, in 1995 TxDOT initiated a change in participation requirements for off-system bridges to pay half of the local government's share (80% federal, 10% state, 10% local). For bridge work contracted in FY 2002, this program provided funding for 170 (in contrast with 146 in FY 2001) structurally deficient and 34 (in contrast with 46 in FY 2001) functionally obsolete bridges, for a total of 204 of the 245 deficient or obsolete bridges (83%) that were awarded contracts in FY 2002.
- State Infrastructure Bank (SIB)—Effective September 1997, this revolving account in the State Highway Fund allows TxDOT to award loans to local governments to support eligible transportation projects.
- Economically Disadvantaged Counties (EDC) Program—Effective January 1998, this program allows TxDOT to adjust a county's matching funds requirements after evaluating the local government's ability to meet the requirement. TxDOT also allows a county participating in the EDC program to use its adjusted participation amount in lieu of all or part of its 10% cost participation in the PWP/EMP program.
- Participation-Waived Project/Equivalent-Match Project (PWP/EMP) Program—Effective August 2000, revised local participation requirements allow 100% federal/state funding of a TxDOT-programmed "participation-waived project (PWP)" in cases where the local government agrees to perform structural improvement work on other "equivalent-match project (EMP)" deficient bridges with a dollar amount at least equal to their normal 10% project match. State design standards apply to the PWPs while the EMP design standards are determined by the local governments based on local needs and standards.
- Simplified local government participation—Effective August 2000, when the local government elects to participate in the cost of a TxDOT-programmed bridge, instead of being responsible for 10% of actual costs, the local government is now responsible for 10% of the estimated project cost at the time the agreement with TxDOT is signed. The local government no longer participates in subsequent overruns in costs of program-eligible project items unless it lets and manages the project.
- Regional Mobility Authorities (RMAs)—Counties are beginning to explore bridge funding through RMAs for toll facilities.

Appendix A – Structurally Deficient, Functionally Obsolete, and Sub-standard-for-Load-Only Off-system Bridges by County

For counts and deck area of structurally deficient on-system span-type bridges by district, see Tables 4-1 and 4-2. The following tables provide counts and deck area of off-system structurally deficient, functionally obsolete, and sub-standard-for-load-only bridges in September 2002.

Table A-1. Count of Structurally Deficient Off-system Span-type Bridges by County, Showing Percent, in September 2002

County	Structurally Deficient Bridges		County	Structurally Deficient Bridges		County	Structurally Deficient Bridges	
	Count	% of Off-system Count		Count	% of Off-system Count		Count	% of Off-system Count
Anderson	22	42.3%	Coke	7	33.3%	Frio	2	14.3%
Andrews	0	0%	Coleman	6	42.9%	Gaines	0	0%
Angelina	7	19.4%	Collin	13	5.1%	Galveston	12	22.6%
Aransas	0	0%	Collings-worth	11	61.1%	Garza	1	100.0%
Archer	7	31.8%	Colorado	7	9.1%	Gillespie	1	6.7%
Armstrong	0	0%	Comal	3	16.7%	Glasscock	0	0%
Atascosa	4	22.2%	Comanche	32	35.6	Goliad	6	14.0%
Austin	26	32.1%	Concho	1	20.0%	Gonzales	32	59.3%
Bailey	0	0%	Cooke	18	16.2%	Gray	5	25.0%
Bandera	2	33.3%	Coryell	10	43.5%	Grayson	22	9.2%
Bastrop	15	20.5%	Cottle	1	4.8%	Gregg	1	3.1%
Baylor	2	66.7%	Crane	0	0%	Grimes	15	17.2%
Bee	1	6.7%	Crockett	0	0%	Guadalupe	1	7.1%
Bell	9	7.8%	Crosby	1	25.0%	Hale	0	0%
Bexar	6	2.2%	Culberson	0	0%	Hall	12	54.5%
Blanco	0	0%	Dallam	0	0%	Hamilton	21	53.8%
Borden	0	0%	Dallas	22	3.1%	Hansford	0	0%
Bosque	4	25.0%	Dawson	0	0%	Hardeman	5	35.7%
Bowie	2	6.3%	Deaf Smith	1	14.3%	Hardin	9	32.1%
Brazoria	43	18.9%	Delta	16	59.3%	Harris	20	1.4%
Brazos	7	12.3%	Denton	39	27.5%	Harrison	5	15.6%
Brewster	0	0%	Dewitt	18	22.5%	Hartley	0	0%
Briscoe	1	33.3%	Dickens	7	58.3%	Haskell	1	11.1%
Brooks	0	0%	Dimmit	1	50.0%	Hays	3	30.0%
Brown	8	19.5%	Donley	7	50.0%	Hemphill	2	40.0%
Burleson	11	22.4%	Duval	0	0%	Henderson	9	23.1%
Burnet	1	6.3%	Eastland	8	30.8%	Hidalgo	7	4.9%
Caldwell	13	31.0%	Ector	0	0%	Hill	55	40.1%
Calhoun	5	22.7%	Edwards	0	0%	Hockley	0	0%
Callahan	7	38.9%	Ellis	26	15.9%	Hood	1	6.7%
Cameron	13	15.5%	El Paso	4	2.6%	Hopkins	30	51.7%
Camp	0	0%	Erath	24	32.4%	Houston	23	28.0%
Carson	1	33.3%	Falls	53	30.6%	Howard	0	0%
Cass	1	12.5%	Fannin	61	43.3%	Hudspeth	0	0%
Castro	0	0%	Fayette	17	13.8%	Hunt	50	49.5%
Chambers	0	0%	Fisher	39	50.0%	Hutchinson	3	30.0%
Cherokee	14	20.9%	Floyd	0	0%	Irion	0	0%
Childress	5	21.7%	Foard	1	9.1%	Jack	14	21.2%
Clay	4	30.8%	Fort Bend	10	4.6%	Jackson	8	20.5%
Cochran	0	0%	Franklin	4	20.0%	Jasper	6	18.8%
			Freestone	24	50.0%	Jeff Davis	0	0%

Table A-1 (Continued). Count of Structurally Deficient Off-system Span-type Bridges by County and, Showing Percent, in September 2002

County	Structurally Deficient Bridges		County	Structurally Deficient Bridges		County	Structurally Deficient Bridges	
	Count	% of Off-system Count		Count	% of Off-system Count		Count	% of Off-system Count
Jefferson	4	4.3%	Mills	5	41.7%	Sherman	0	0%
Jim Hogg	0	0%	Mitchell	6	30.0%	Smith	20	22.0%
Jim Wells	2	13.3%	Montague	21	17.6%	Somervell	1	50.0%
Johnson	8	10.4%	Montgom-ery	9	7.7%	Starr	1	11.1%
Jones	19	52.8%	Moore	1	50.0%	Stephens	0	0%
Karnes	15	38.5%	Morris	3	21.4%	Sterling	1	50.0%
Kaufman	13	35.1%	Motley	4	44.4%	Stonewall	6	42.9%
Kendall	2	15.4%	Nacog-doches	4	3.6%	Sutton	0	0%
Kenedy	0	0%	Navarro	30	33.3%	Swisher	3	60.0%
Kent	3	42.9%	Newton	7	21.9%	Tarrant	36	10.9%
Kerr	4	22.2%	Nolan	5	18.5%	Taylor	8	21.6%
Kimble	0	0%	Nueces	30	35.7%	Terrell	0	0%
King	2	100.0%	Ochiltree	1	50.0%	Terry	0	0%
Kinney	0	0%	Oldham	0	0%	Throckmor-ton	0	0%
Kleberg	0	0%	Orange	6	14.6%	Titus	18	52.9%
Knox	3	50.0%	Palo Pinto	17	32.1%	Tom Green	1	5.6%
Lamar	45	43.7%	Panola	1	7.1%	Travis	8	3.3%
Lamb	0	0%	Parker	37	26.4%	Trinity	7	36.8%
Lampasas	1	7.1%	Parmer	0	0%	Tyler	15	30.6%
LaSalle	2	8.7%	Pecos	0	0%	Upshur	2	40.0%
Lavaca	9	7.1%	Polk	29	35.4%	Upton	0	0%
Lee	5	8.9%	Potter	1	14.3%	Uvalde	0	0%
Leon	5	14.7%	Presidio	1	50.0%	Val Verde	0	0%
Liberty	13	33.3%	Rains	4	25.0%	Van Zandt	38	46.9%
Limestone	64	42.7%	Randall	0	0%	Victoria	7	8.9%
Lipscomb	1	33.3%	Reagan	0	0%	Walker	8	32.0%
Live Oak	9	50.0%	Real	0	0%	Waller	5	8.6%
Llano	2	28.6%	Red River	19	48.7%	Ward	0	0%
Loving	0	0%	Reeves	1	25.0%	Washing-ton	30	27.8%
Lubbock	0	0%	Refugio	0	0%	Webb	1	1.8%
Lynn	0	0%	Roberts	0	0%	Wharton	22	11.8%
Madison	9	33.3%	Robertson	20	54.1%	Wheeler	4	21.1%
Marion	4	44.4%	Rockwall	0	0%	Wichita	5	19.2%
Martin	0	0%	Runnels	8	32.0%	Wilbarger	13	39.4%
Mason	3	37.5%	Rusk	9	9.3%	Willacy	3	5.6%
Matagorda	2	2.4%	Sabine	19	63.3%	Williamson	13	11.1%
Maverick	4	25.0%	San Augustine	15	68.2%	Wilson	16	47.1%
McCulloch	2	15.4%	San Jacinto	6	6.3%	Winkler	0	0%
McLennan	38	19.9%	San Patricio	3	14.3%	Wise	47	37.9%
McMullen	1	25.0%	San Saba	7	41.1%	Wood	6	46.2%
Medina	6	20.7%	Schleicher	1	100.0%	Yoakum	0	0%
Menard	2	66.7%	Scurry	5	17.9%	Young	8	42.1%
Midland	0	0%	Shackel-ford	6	50.0%	Zapata	0	0%
Milam	16	30.8%	Shelby	33	39.8%	Zavala	1	50.0%

Table A-2. Structurally Deficient Off-system Span-type Bridge Deck Area in Sq. Ft. by County, Showing Percent in September 2002

County	Structurally Deficient Bridges		County	Structurally Deficient Bridges		County	Structurally Deficient Bridges	
	Deck Area (Sq. Ft.)	% of Off-system Deck Area		Deck Area (Sq. Ft.)	% of Off-system Deck Area		Deck Area (Sq. Ft.)	% of Off-system Deck Area
Anderson	17,449	24.1%	Coryell	15,146	26.5%	Hardeman	8,779	47.3%
Andrews	0	0%	Cottle	732	4.8%	Hardin	6,779	10.0%
Angelina	5,706	15.8%	Crane	0	0%	Harris	145,119	1.5%
Aransas	0	0%	Crockett	0	0%	Harrison	3,674	4.3%
Archer	3,556	19.2%	Crosby	1,088	14.8%	Hartley	0	0%
Armstrong	0	0%	Culberson	0	0%	Haskell	543	4.1%
Atascosa	2,225	12.5%	Dallam	0	0%	Hays	4,907	14.2%
Austin	18,617	22.1%	Dallas	340,323	4.0%	Hemphill	6,512	27.8%
Bailey	0	0%	Dawson	0	0%	Henderson	7,157	22.9%
Bandera	1,326	20.7%	Deaf Smith	1,280	16.5%	Hidalgo	6,487	0.5%
Bastrop	11,101	7.4%	Delta	12,231	48.3%	Hill	54,714	34.6%
Baylor	1,230	73.6%	Denton	43,562	7.4%	Hockley	0	0%
Bee	1,440	3.5%	Dewitt	18,211	14.1%	Hood	1,740	5.6%
Bell	29,529	7.1%	Dickens	6,680	45.6%	Hopkins	15,871	42.5%
Bexar	60,903	2.0%	Dimmit	1,310	77.3%	Houston	17,899	33.6%
Blanco	0	0%	Donley	8,175	30.9%	Howard	0	0%
Borden	0	0%	Duval	0	0%	Hudspeth	0	0%
Bosque	9,754	19.1%	Eastland	3,987	13.4%	Hunt	29,612	35.4%
Bowie	2,678	1.3%	Ector	0	0%	Hutchinson	49,308	78.3%
Brazoria	96,842	16.0%	Edwards	0	0%	Irion	0	0%
Brazos	6,715	6.2%	Ellis	30,034	14.7%	Jack	7,986	14.3%
Brewster	0	0%	El Paso	96,459	10.8%	Jackson	10,841	14.7%
Briscoe	480	12.7%	Erath	18,945	23.4%	Jasper	4,397	8.3%
Brooks	0	0%	Falls	63,879	34.7%	Jeff Davis	0	0%
Brown	9,299	11.2%	Fannin	44,892	45.9%	Jefferson	10,738	3.5%
Burleson	7,636	14.2%	Fayette	15,415	10.9%	Jim Hogg	0	0%
Burnet	1,632	5.7%	Fisher	50,723	64.2%	Jim Wells	4,816	17.3%
Caldwell	13,650	17.2%	Floyd	0	0%	Johnson	23,156	15.7%
Calhoun	3,037	9.9%	Foard	1,844	19.1%	Jones	24,778	43.7%
Callahan	5,100	18.1%	Fort Bend	14,650	2.2%	Karnes	19,042	29.2%
Cameron	11,096	2.2%	Franklin	4,759	31.8%	Kaufman	13,764	42.8%
Camp	0	0%	Freestone	17,220	48.6%	Kendall	2,274	4.5%
Carson	1,137	42.6%	Frio	906	7.0%	Kenedy	0	0%
Cass	469	2.3%	Gaines	0	0%	Kent	4,187	43.4%
Castro	0	0%	Galveston	358,775	68.1%	Kerr	10,528	15.7%
Chambers	0	0%	Garza	552	100%	Kimble	0	0%
Cherokee	10,225	18.6%	Gillespie	328	0.9%	King	2,936	100%
Childress	7,051	12.0%	Glasscock	0	0%	Kinney	0	0%
Clay	4,683	30.8%	Goliad	4,496	5.7%	Kleberg	0	0%
Cochran	0	0%	Gonzales	31,651	61.5%	Knox	1,958	47.1%
Coke	5,517	16.3%	Gray	7,639	17.6%	Lamar	41,397	45.0%
Coleman	18,694	38.9%	Grayson	17,768	4.5%	Lamb	0	0%
Collin	10,714	0.5%	Gregg	4,590	3.3%	Lampasas	2,386	6.4%
Collings-worth	10,544	64.6%	Grimes	10,969	14.8%	LaSalle	1,746	7.2%
Colorado	5,643	5.0%	Guadalupe	821	2.8%	Lavaca	12,920	5.8%
Comal	14,106	13.4%	Hale	0	0%	Lee	4,005	5.8%
Comanche	22,530	20.3%	Hall	11,078	53.7%	Leon	3,851	15.1%
Concho	1,562	24.2%	Hamilton	46,039	49.1	Liberty	9,652	19.3%
Cooke	13,720	9.0%	Hansford	0	0%	Limestone	46,875	37.0%

Table A-2 (Continued). Structurally Deficient Off-system Span-type Bridge Deck Area in Sq. Ft. by County, Showing Percent, in September 2002

County	Structurally Deficient Bridges		County	Structurally Deficient Bridges		County	Structurally Deficient Bridges	
	Deck Area (Sq. Ft.)	% of Off-system Deck Area		Deck Area (Sq. Ft.)	% of Off-system Deck Area		Deck Area (Sq. Ft.)	% of Off-system Deck Area
Lipscomb	640	33.3%	Parker	39,557	19.4%	Tarrant	423,180	13.7%
Live Oak	21,122	69.1%	Parmer	0	0%	Taylor	7,095	4.8%
Llano	1,249	20.4%	Pecos	0	0%	Terrell	0	0%
Loving	0	0%	Polk	17,983	26.0%	Terry	0	0%
Lubbock	0	0%	Potter	86,317	37.3%	Throckmor-ton	0	0%
Lynn	0	0%	Presidio	386	41.4%	Titus	13,216	22.6%
Madison	5,047	29.8%	Rains	2,553	26.7%	Tom Green	15,523	7.4%
Marion	2,493	20.7%	Randall	0	0%	Travis	17,605	0.8%
Martin	0	0%	Reagan	0	0%	Trinity	3,615	15.9%
Mason	5,174	60.5%	Real	0	0%	Tyler	10,623	27.1%
Matagorda	3,734	2.4%	Red River	14,211	36.4%	Upshur	734	3.5%
Maverick	2,594	1.4%	Reeves	629	14.4%	Upton	0	0%
McCulloch	1,536	6.5%	Refugio	0	0%	Uvalde	0	0%
McLennan	60,633	9.3%	Roberts	0	0%	Val Verde	0	0%
McMullen	588	25.3%	Robertson	25,180	47.0%	Van Zandt	23,688	45.6%
Medina	7,662	18.9%	Rockwall	0	0%	Victoria	10,502	4.8%
Menard	14,025	87.7%	Runnels	8,242	13.5%	Walker	6,590	22.7%
Midland	0	0%	Rusk	8,692	6.7%	Waller	4,792	5.4%
Milam	26,903	29.6%	Sabine	18,823	58.8%	Ward	0	0%
Mills	10,997	52.5%	San Augustine	9,561	63.2%	Washing-ton	31,085	28.4%
Mitchell	8,742	20.2%	San Jacinto	2,688	11.2%	Webb	1,025	0.2%
Montague	15,603	14.8%	San Patricio	2,862	7.4%	Wharton	27,349	10.6%
Montgom-ery	29,143	6.9%	San Saba	13,643	48.9%	Wheeler	2,413	12.6%
Moore	1,300	72.8%	Schleicher	4,402	100%	Wichita	11,363	14.7%
Morris	3,657	19.9%	Scurry	4,440	8.9%	Wilbarger	11,855	36.9%
Motley	2,438	17.8%	Shackel-ford	11,084	45.4%	Willacy	4,089	3.2%
Nacog-doches	8,265	5.3%	Shelby	16,756	30.1%	Williamson	16,701	4.1%
Navarro	19,781	17.2%	Sherman	0	0%	Wilson	29,847	41.5%
Newton	7,881	23.2%	Smith	20,572	15.5%	Winkler	0	0%
Nolan	4,052	15.2%	Somervell	2,520	60.1%	Wise	35,917	24.3%
Nueces	54,439	28.0%	Starr	15,096	26.2%	Wood	6,317	41.1%
Ochiltree	1,342	23.8%	Stephens	0	0%	Yoakum	0	0%
Oldham	0	0%	Sterling	1,248	69.6%	Young	5,388	18.6%
Orange	10,045	7.8%	Stonewall	6,731	17.4%	Zapata	0	0%
Palo Pinto	14,569	25.3%	Sutton	0	0%	Zavala	2,528	82.4%
Panola	5,346	26.7%	Swisher	2,998	50.5%			

Table A-3. Count of Functionally Obsolete Off-system Span-type Bridges by County, Showing Percent, in September 2002

County	Functionally Obsolete Bridges		County	Functionally Obsolete Bridges		County	Functionally Obsolete Bridges	
	Count	% of Off-system Count		Count	% of Off-system Count		Count	% of Off-system Count
Anderson	12	23.1%	Coryell	2	8.7%	Hardeman	2	14.3%
Andrews	0	0%	Cottle	4	19.0%	Hardin	1	7.1%
Angelina	7	19.4%	Crane	0	0%	Harris	866	61.2%
Aransas	1	50.0%	Crockett	0	0%	Harrison	6	18.8%
Archer	7	31.8%	Crosby	1	25.0%	Hartley	0	0%
Armstrong	1	100.0%	Culberson	0	0%	Haskell	2	22.2%
Atascosa	1	5.6%	Dallam	0	0%	Hays	6	60.0%
Austin	16	19.8%	Dallas	419	58.5%	Hemphill	1	20.0%
Bailey	0	0%	Dawson	0	0%	Henderson	26	66.7%
Bandera	3	50.0%	Deaf Smith	1	14.3%	Hidalgo	43	30.3%
Bastrop	15	20.5%	Delta	1	3.7%	Hill	36	26.3%
Baylor	0	0%	Denton	56	39.4%	Hockley	0	0%
Bee	5	33.3%	Dewitt	17	21.3%	Hood	4	26.7%
Bell	32	27.6%	Dickens	1	8.3%	Hopkins	15	25.9%
Bexar	111	41.3%	Dimmit	1	50.0%	Houston	15	18.3%
Blanco	1	20.0%	Donley	1	7.1%	Howard	2	33.3%
Borden	0	0%	Duval	0	0%	Hudspeth	0	0%
Bosque	0	0%	Eastland	4	15.4%	Hunt	6	5.9%
Bowie	9	28.1%	Ector	0	0%	Hutchinson	2	20.0%
Brazoria	52	22.9%	Edwards	0	0%	Irion	0	0%
Brazos	20	35.1%	Ellis	63	38.4%	Jack	18	27.3%
Brewster	1	20.0%	El Paso	20	13.2%	Jackson	13	33.3%
Briscoe	0	0%	Erath	18	24.3%	Jasper	17	53.1%
Brooks	1	50.0%	Falls	36	20.8%	Jeff Davis	0	0%
Brown	8	19.5%	Fannin	40	28.4%	Jefferson	26	27.7%
Burleson	12	24.4%	Fayette	61	49.6%	Jim Hogg	0	0%
Burnet	2	12.5%	Fisher	15	19.2%	Jim Wells	2	13.3%
Caldwell	12	28.6%	Floyd	0	0%	Johnson	16	20.8%
Calhoun	4	18.1%	Foard	1	9.1%	Jones	5	13.9%
Callahan	2	11.1%	Fort Bend	82	37.6%	Karnes	3	7.7%
Cameron	13	15.5%	Franklin	6	30.0%	Kaufman	16	43.2%
Camp	0	0%	Freestone	12	25.0%	Kendall	3	23.1%
Carson	2	66.7%	Frio	7	50.0%	Kenedy	0	0%
Cass	1	12.5%	Gaines	0	0%	Kent	1	14.3%
Castro	0	0%	Galveston	15	28.3%	Kerr	6	33.3%
Chambers	1	5.6%	Garza	0	0%	Kimble	2	100.0%
Cherokee	23	34.3%	Gillespie	5	33.3%	King	0	0%
Childress	1	4.3%	Glasscock	0	0%	Kinney	0	0%
Clay	2	15.4%	Goliad	6	14.0%	Kleberg	0	0%
Cochran	0	0%	Gonzales	10	18.5%	Knox	0	0%
Coke	2	9.5%	Gray	4	20.0%	Lamar	31	30.1%
Coleman	4	28.6%	Grayson	56	23.0%	Lamb	0	0%
Collin	99	38.8%	Gregg	7	21.9%	Lampasas	3	21.4%
Collings-worth	1	5.6%	Grimes	29	33.3%	LaSalle	0	0%
Colorado	5	6.5%	Guadalupe	6	42.9%	Lavaca	66	52.4%
Comal	8	44.4%	Hale	1	100.0%	Lee	22	39.3%
Comanche	13	14.4%	Hall	1	4.5%	Leon	8	23.5%
Concho	1	20.0%	Hamilton	3	7.7%	Liberty	4	10..3%
Cooke	22	19.8%	Hansford	0	0%	Limestone	54	36.0%

Table A-3 (Continued). Count of Functionally Obsolete Off-system Span-type Bridges by County, Showing Percent, in September 2002

County	Functionally Obsolete Bridges		County	Functionally Obsolete Bridges		County	Functionally Obsolete Bridges	
	Count	% of Off-system Count		Count	% of Off-system Count		Count	% of Off-system Count
Lipscomb	0	0%	Parker	34	24.3%	Tarrant	140	42.4%
Live Oak	4	22.2%	Parmer	0	0%	Taylor	10	27.0%
Llano	2	28.6%	Pecos	0	0%	Terrell	0	0%
Loving	0	0%	Polk	35	42.7%	Terry	0	0%
Lubbock	0	0%	Potter	1	14.3%	Throckmor-ton	0	0%
Lynn	0	0%	Presidio	1	50.0%	Titus	4	11.8%
Madison	10	37.0%	Rains	9	56..3%	Tom Green	4	22.2%
Marion	4	44.4%	Randall	1	33.3%	Travis	67	27.6%
Martin	0	0%	Reagan	0	0%	Trinity	1	5.3%
Mason	2	25.0%	Real	0	0%	Tyler	12	24.5%
Matagorda	8	9.6%	Red River	6	15.4%	Upshur	1	20.0%
Maverick	2	12.5%	Reeves	1	25.0%	Upton	0	0%
McCulloch	4	30.8%	Refugio	4	17.4%	Uvalde	0	0%
McLennan	48	25.1%	Roberts	1	100.0%	Val Verde	6	85.7%
McMullen	2	50.0%	Robertson	6	16.2%	Van Zandt	28	34.6%
Medina	11	37.9%	Rockwall	0	0%	Victoria	22	27.8%
Menard	1	33.3%	Runnels	8	32.0%	Walker	3	12.0%
Midland	0	0%	Rusk	38	39.2%	Waller	8	13.8%
Milam	19	36.5%	Sabine	5	16.7%	Ward	0	0%
Mills	0	0%	San Augustine	2	9.1%	Washing-ton	40	37.0%
Mitchell	3	15.0%	San Jacinto	2	12.5%	Webb	41	71.9%
Montague	32	26.9%	San Patricio	8	38.1%	Wharton	10	5.4%
Montgom-ery	33	28.2%	San Saba	4	23.5%	Wheeler	1	5.3%
Moore	0	0%	Schleicher	0	0%	Wichita	7	26.9%
Morris	6	42.9%	Scurry	0	0%	Wilbarger	6	18.1%
Motley	1	11.1%	Shackel-ford	2	16.7%	Willacy	4	7.4%
Nacog-doches	32	29.1%	Shelby	22	26.5%	Williamson	24	20.5%
Navarro	25	27.8%	Sherman	0	0%	Wilson	3	8.8%
Newton	9	28.1%	Smith	16	17.6%	Winkler	0	0%
Nolan	3	11.1%	Somervell	0	0%	Wise	29	23.4%
Nueces	9	10.7%	Starr	5	55.6%	Wood	1	7.7%
Ochiltree	0	0%	Stephens	6	21.4%	Yoakum	0	0%
Oldham	0	0%	Sterling	1	50.0%	Young	5	26.3%
Orange	9	22.0%	Stonewall	2	14.3%	Zapata	0	0%
Palo Pinto	9	17.0%	Sutton	0	0%	Zavala	0	0%
Panola	4	28.6%	Swisher	0	0%			

Table A-4. Functionally Obsolete Off-system Span-type Bridge Deck Area in Sq. Ft. by County, Showing Percent, in September 2002

County	Functionally Obsolete Bridges		County	Functionally Obsolete Bridges		County	Functionally Obsolete Bridges	
	Deck Area (Sq. Ft.)	% of Off-system Deck Area		Deck Area (Sq. Ft.)	% of Off-system Deck Area		Deck Area (Sq. Ft.)	% of Off-system Deck Area
Anderson	10,333	14.2%	Coryell	1,197	2.1%	Hardeman	2,744	14.8%
Andrews	0	0%	Cottle	2,477	16.2%	Hardin	6,242	9.2%
Angelina	6,015	16.6%	Crane	0	0%	Harris	6,223,021	66.4%
Aransas	3,332	73.1%	Crockett	0	0%	Harrison	3,587	4.2%
Archer	4,580	24.7%	Crosby	792	10.8%	Hartley	0	0%
Armstrong	945	100%	Culberson	0	0%	Haskell	1,010	7.6%
Atascosa	581	3.3%	Dallam	0	0%	Hays	18,512	53.4%
Austin	13,858	16.5%	Dallas	4,888,492	57.3%	Hemphill	790	3.4%
Bailey	0	0%	Dawson	0	0%	Henderson	19,729	63.1%
Bandera	1,827	28.5%	Deaf Smith	1,128	14.5%	Hidalgo	1,039,085	80.4%
Bastrop	15,132	10.1%	Delta	1,152	4.6%	Hill	31,055	19.6%
Baylor	0	0%	Denton	263,952	45.1%	Hockley	0	0%
Bee	4,104	9.9%	Dewitt	17,096	13.2%	Hood	5,920	19.0%
Bell	171,834	41.4%	Dickens	480	3.3%	Hopkins	9,265	24.8%
Bexar	1,481,470	49.7%	Dimmit	384	22.7%	Houston	8,021	15.1%
Blanco	2,850	15.9%	Donley	552	2.1%	Howard	1,760	5.5%
Borden	0	0%	Duval	0	0%	Hudspeth	0	0%
Bosque	0	0%	Eastland	2,261	7.6%	Hunt	3,390	4.1%
Bowie	146,436	68.9%	Ector	0	0%	Hutchinson	2,124	3.4%
Brazoria	215,338	35.5%	Edwards	0	0%	Irion	0	0%
Brazos	25,004	23.1%	Ellis	71,063	34.8%	Jack	10,220	18.3%
Brewster	1,242	7.8%	El Paso	166,849	18.7%	Jackson	15,684	21.2%
Briscoe	0	0%	Erath	18,022	22.2%	Jasper	20,559	38.6%
Brooks	1,065	40.2%	Falls	29,283	15.9%	Jeff Davis	0	0%
Brown	22,186	26.6%	Fannin	22,855	23.4%	Jefferson	77,040	25.1%
Burleson	11,902	22.1%	Fayette	66,074	46.9%	Jim Hogg	0	0%
Burnet	1,153	4.0%	Fisher	11,411	14.4%	Jim Wells	3,728	13.4%
Caldwell	12,885	16.2%	Floyd	0	0%	Johnson	24,858	16.9%
Calhoun	5,007	16.3%	Foard	688	7.1%	Jones	3,314	5.8%
Callahan	1,874	6.6%	Fort Bend	347,542	51.1%	Karnes	7,614	11.7%
Cameron	83,904	17.0%	Franklin	3,063	20.4%	Kaufman	12,479	38.8%
Camp	0	0%	Freestone	9,960	28.1%	Kendall	1,999	3.9%
Carson	1,531	57.4%	Frio	4,376	33.9%	Kenedy	0	0%
Cass	456	2.3%	Gaines	0	0%	Kent	1,416	14.7%
Castro	0	0%	Galveston	83,500	15.9%	Kerr	23,639	35.3%
Chambers	902	1.8%	Garza	0	0%	Kimble	4,109	100%
Cherokee	19,716	35.9%	Gillespie	13,209	35.8%	King	0	0%
Childress	980	1.7%	Glasscock	0	0%	Kinney	0	0%
Clay	1,295	8.5%	Goliad	8,648	11.0%	Kleberg	0	0%
Cochran	0	0%	Gonzales	9,291	18.0%	Knox	0	0%
Coke	1,797	5.3%	Gray	11,098	25.6%	Lamar	21,442	23.3%
Coleman	17,301	36.0%	Grayson	68,952	17.5%	Lamb	0	0%
Collin	1,164,249	50.9%	Gregg	12,278	8.9%	Lampasas	3,913	10.4%
Collings-worth	1,015	6.2%	Grimes	25,010	33.7%	LaSalle	0	0%
Colorado	3,460	3.1%	Guadalupe	8,995	31.0%	Lavaca	78,877	35.3%
Comal	48,342	46.0%	Hale	3,150	100%	Lee	18,143	26.4%
Comanche	11,719	10.6%	Hall	624	3.0%	Leon	6,323	24.7%
Concho	855	13.3%	Hamilton	3,929	4.2%	Liberty	2,598	5.2%
Cooke	24,907	16.3%	Hansford	0	0%	Limestone	38,412	30.4%

Table A-4 (Continued). Functionally Obsolete Off-system Span-type Bridge Deck Area in Sq. Ft. by County, Showing Percent, in September 2002

County	Functionally Obsolete Bridges		County	Functionally Obsolete Bridges		County	Functionally Obsolete Bridges	
	Deck Area (Sq. Ft.)	% of Off-system Deck Area		Deck Area (Sq. Ft.)	% of Off-system Deck Area		Deck Area (Sq. Ft.)	% of Off-system Deck Area
Lipscomb	0	0%	Parker	39,905	19.6%	Tarrant	1,576,967	56.0%
Live Oak	4,470	14.6%	Parmer	0	0%	Taylor	29,953	20.1%
Llano	1,497	24.5%	Pecos	0	0%	Terrell	0	0%
Loving	0	0%	Polk	36,824	53.3%	Terry	0	0%
Lubbock	0	0%	Potter	78,030	33.7%	Throckmor-ton	0	0%
Lynn	0	0%	Presidio	545	58.5%	Titus	2,848	4.9%
Madison	7,616	45.0%	Rains	4,964	52.0%	Tom Green	43,873	20.8%
Marion	6,963	57.9%	Randall	2,170	3.4%	Travis	708,883	31.4%
Martin	0	0%	Reagan	0	0%	Trinity	2,400	10.5%
Mason	1,448	16.9%	Real	0	0%	Tyler	7,822	19.9%
Matagorda	10,601	6.8%	Red River	3,956	10.1%	Upshur	6,420	30.8%
Maverick	67,863	35.4%	Reeves	400	9.1%	Upton	0	0%
McCulloch	9,548	40.2%	Refugio	9,228	22.9%	Uvalde	0	0%
McLennan	205,576	31.6%	Roberts	816	100%	Val Verde	134,831	92.2%
McMullen	980	42.2%	Robertson	6,442	12.0%	Van Zandt	16,368	31.5%
Medina	11,986	29.5%	Rockwall	0	0%	Victoria	27,091	12.3%
Menard	1,960	12.3%	Runnels	10,325	17.0%	Walker	1,626	5.6%
Midland	0	0%	Rusk	29,933	23.6%	Waller	14,544	16.3%
Milam	18,181	20.0%	Sabine	4,192	13.1%	Ward	0	0%
Mills	0	0%	San Augustine	1,287	8.5%	Washing-ton	31,527	28.8%
Mitchell	4,316	10.0%	San Jacinto	4,034	16.8%	Webb	93,036	18.4%
Montague	22,574	21.4%	San Patricio	11,106	28.7%	Wharton	10,036	3.9%
Montgom-ery	142,276	33.6%	San Saba	1,676	6.0%	Wheeler	1,062	5.6%
Moore	0	0%	Schleicher	0	0%	Wichita	24,446	31.5%
Morris	11,044	60.2%	Scurry	0	0%	Wilbarger	7,010	21.8%
Motley	1,000	7.3%	Shackel-ford	2,727	11.1%	Willacy	3,406	2.7%
Nacog-doches	33,223	21.3%	Shelby	13,460	24.3%	Williamson	65,993	16.1%
Navarro	23,984	20.9%	Sherman	0	0%	Wilson	2,145	3.0%
Newton	5,346	15.7%	Smith	16,783	12.6%	Winkler	0	0%
Nolan	1,694	6.4%	Somervell	0	0%	Wise	19,960	13.5%
Nueces	47,209	24.2%	Starr	36,850	64.0%	Wood	920	6.0%
Ochiltree	0	0%	Stephens	3,503	7.0%	Yoakum	0	0%
Oldham	0	0%	Sterling	546	30.4%	Young	7,737	26.7%
Orange	20,356	15.9%	Stonewall	2,816	7.3%	Zapata	0	0%
Palo Pinto	7,471	13.0%	Sutton	0	0%	Zavala	0	0%
Panola	3,409	17.1%	Swisher	0	0%			

Table A-5. Count of Sub-standard-for-Load-Only Off-system Span-type Bridges by County, Showing Percent, in September 2002

County	Sub-standard-for-Load-Only Bridges		County	Sub-standard-for-Load-Only Bridges		County	Sub-standard-for-Load-Only Bridges	
	Count	% of Off-system Count		Count	% of Off-system Count		Count	% of Off-system Count
Anderson	8	15.9%	Coryell	1	4.3%	Hardeman	2	14.3%
Andrews	0	0%	Cottle	0	0%	Hardin	2	7.1%
Angelina	2	5.6%	Crane	0	0%	Harris	23	1.6%
Aransas	0	0%	Crockett	0	0%	Harrison	4	12.5%
Archer	6	27.3%	Crosby	1	25.0%	Hartley	0	0%
Armstrong	0	0%	Culberson	0	0%	Haskell	0	0%
Atascosa	5	27.8%	Dallam	0	0%	Hays	0	0%
Austin	17	21.0%	Dallas	6	0.8%	Hemphill	2	40.0%
Bailey	0	0%	Dawson	0	0%	Henderson	1	2.6%
Bandera	0	0%	Deaf Smith	4	57.1%	Hidalgo	4	2.8%
Bastrop	4	5.5%	Delta	4	14.8%	Hill	30	21.9%
Baylor	0	0%	Denton	9	6.3%	Hockley	0	0%
Bee	3	20.0%	Dewitt	6	7.5%	Hood	0	0%
Bell	2	1.7%	Dickens	1	8.3%	Hopkins	6	10.3%
Bexar	9	3.3%	Dimmit	0	0%	Houston	30	36.6%
Blanco	1	20.0%	Donley	1	7.1%	Howard	3	50.0%
Borden	1	33.3%	Duval	0	0%	Hudspeth	0	0%
Bosque	2	12.5%	Eastland	2	7.7%	Hunt	6	5.9%
Bowie	0	0%	Ector	0	0%	Hutchinson	1	10.0%
Brazoria	81	35.7%	Edwards	0	0%	Irion	0	0%
Brazos	5	8.8%	Ellis	35	21.3%	Jack	14	21.2%
Brewster	1	20.0%	El Paso	69	45.4%	Jackson	7	17.9%
Briscoe	1	33.3%	Erath	9	12.2%	Jasper	2	6.3%
Brooks	0	0%	Falls	48	27.7%	Jeff Davis	0	0%
Brown	1	2.4%	Fannin	25	17.7%	Jefferson	19	20.2%
Burleson	14	28.6%	Fayette	8	6.5%	Jim Hogg	0	0%
Burnet	2	12.5%	Fisher	15	19.2%	Jim Wells	2	13.3%
Caldwell	1	2.4%	Floyd	1	100.0%	Johnson	6	7.8%
Calhoun	3	13.6%	Foard	2	18.2%	Jones	4	11.1%
Callahan	4	22.2%	Fort Bend	55	25.2%	Karnes	1	2.6%
Cameron	3	3.6%	Franklin	2	10.0%	Kaufman	7	18.9%
Camp	0	0%	Freestone	7	14.6%	Kendall	1	7.7%
Carson	0	0%	Frio	2	14.3%	Kenedy	0	0%
Cass	1	12.5%	Gaines	0	0%	Kent	3	42.9%
Castro	0	0%	Galveston	4	7.5%	Kerr	2	11.8%
Chambers	9	50.0%	Garza	0	0%	Kimble	0	0%
Cherokee	22	32.8%	Gillespie	3	20.0%	King	0	0%
Childress	0	0%	Glasscock	0	0%	Kinney	0	0%
Clay	0	0%	Goliad	1	2.3%	Kleberg	1	50.0%
Cochran	0	0%	Gonzales	9	16.7%	Knox	1	16.7%
Coke	1	4.8%	Gray	8	40.0%	Lamar	2	1.9%
Coleman	0	0%	Grayson	13	5.4%	Lamb	0	0%
Collin	3	1.2%	Gregg	4	12.5%	Lampasas	2	14.3%
Collings-worth	3	16.7%	Grimes	12	13.8%	LaSalle	6	26.1%
Colorado	8	10.4%	Guadalupe	3	21.4%	Lavaca	10	7.9%
Comal	0	0%	Hale	0	0%	Lee	1	1.8%
Comanche	9	10.0%	Hall	4	18.2%	Leon	9	26.5%
Concho	0	0%	Hamilton	5	12.8%	Liberty	13	33.3%
Cooke	14	12.6%	Hansford	3	75.0%	Limestone	16	10.7%

Table A-5 (Continued). Count of Sub-standard-for-Load-Only Off-system Span-type Bridges by County, Showing Percent, in September 2002

County	Sub-standard-for-Load-Only Bridges		County	Sub-standard-for-Load-Only Bridges		County	Sub-standard-for-Load-Only Bridges	
	Count	% of Off-system Count		Count	% of Off-system Count		Count	% of Off-system Count
Lipscomb	1	33.3%	Parker	32	22.9%	Tarrant	6	1.8%
Live Oak	5	27.8%	Parmer	0	0%	Taylor	4	10.8%
Llano	1	14.3%	Pecos	0	0%	Terrell	0	0%
Loving	0	0%	Polk	13	15.9%	Terry	0	0%
Lubbock	0	0%	Potter	1	14.3%	Throckmor-ton	1	12.5%
Lynn	0	0%	Presidio	0	0%	Titus	6	17.6%
Madison	7	25.9%	Rains	1	6.3%	Tom Green	2	11.1%
Marion	0	0%	Randall	0	0%	Travis	4	1.6%
Martin	0	0%	Reagan	0	0%	Trinity	5	26.3%
Mason	3	37.5%	Real	0	0%	Tyler	9	18.4%
Matagorda	17	20.5%	Red River	5	12.8%	Upshur	0	0%
Maverick	3	18.8%	Reeves	0	0%	Upton	0	0%
McCulloch	3	23.1%	Refugio	1	4.3%	Uvalde	0	0%
McLennan	29	15.2%	Roberts	0	0%	Val Verde	0	0%
McMullen	1	25.0%	Robertson	6	16.2%	Van Zandt	12	14.8%
Medina	3	10.3%	Rockwall	3	75.0%	Victoria	3	3.8%
Menard	0	0%	Runnels	5	20.0%	Walker	5	20.0%
Midland	0	0%	Rusk	18	18.6%	Waller	21	36.2%
Milam	1	1.9%	Sabine	2	6.7%	Ward	0	0%
Mills	2	16.7%	San Augustine	5	22.7%	Washing-ton	14	13.0%
Mitchell	5	25.0%	San Jacinto	3	18.8%	Webb	0	0%
Montague	9	7.6%	San Patricio	0	0%	Wharton	56	30.1%
Montgom-ery	6	5.1%	San Saba	1	5.9%	Wheeler	3	15.8%
Moore	1	50.5%	Schleicher	0	0%	Wichita	1	3.8%
Morris	0	0%	Scurry	6	21.4%	Wilbarger	7	21.2%
Motley	2	22.2%	Shackel-ford	2	16.7%	Willacy	6	11.1%
Nacog-doches	2	1.8%	Shelby	14	16.9%	Williamson	5	4.3%
Navarro	19	21.1%	Sherman	0	0%	Wilson	4	11.8%
Newton	5	15.6%	Smith	29	31.9%	Winkler	0	0%
Nolan	9	33.3%	Somervell	0	0%	Wise	15	12.1%
Nueces	24	28.6%	Starr	1	11.1%	Wood	1	7.7%
Ochiltree	0	0%	Stephens	3	10.7%	Yoakum	0	0%
Oldham	0	0%	Sterling	0	0%	Young	1	5.3%
Orange	21	51.2%	Stonewall	2	14.3%	Zapata	0	0%
Palo Pinto	5	9.4%	Sutton	0	0%	Zavala	0	0%
Panola	0	0%	Swisher	1	20.0%			

Table A-6. Sub-standard-for-Load-Only Off-system Span-type Bridge Deck Area in Sq. Ft. by County, Showing Percent, in September 2002

County	Sub-standard-for-Load-Only Bridges		County	Sub-standard-for-Load-Only Bridges		County	Sub-standard-for-Load-Only Bridges	
	Deck Area (Sq. Ft.)	% of Off-system Deck Area		Deck Area (Sq. Ft.)	% of Off-system Deck Area		Deck Area (Sq. Ft.)	% of Off-system Deck Area
Anderson	4,860	6.7%	Coryell	1,187	2.1%	Hardeman	2,161	11.6%
Andrews	0	0%	Cottle	0	0%	Hardin	1,640	2.4%
Angelina	1,155	3.2%	Crane	0	0%	Harris	79,460	0.8%
Aransas	0	0%	Crockett	0	0%	Harrison	3,398	4.0%
Archer	6,409	34.6%	Crosby	1,026	13.9%	Hartley	0	0%
Armstrong	0	0%	Culberson	0	0%	Haskell	0	0%
Atascosa	3,541	19.8%	Dallam	0	0%	Hays	0	0%
Austin	12,327	14.6%	Dallas	51,881	0.6%	Hemphill	16,083	68.8%
Bailey	0	0%	Dawson	0	0%	Henderson	382	1.2%
Bandera	0	0%	Deaf Smith	4,705	60.7%	Hidalgo	5,221	0.4%
Bastrop	2,536	1.7%	Delta	3,392	13.4%	Hill	41,857	26.5%
Baylor	0	0%	Denton	15,428	2.6%	Hockley	0	0%
Bee	3,915	9.4%	Dewitt	4,334	3.4%	Hood	0	0%
Bell	6,003	1.4%	Dickens	500	3.4%	Hopkins	4,188	11.2%
Bexar	91,920	3.1%	Dimmit	0	0%	Houston	18,028	33.9%
Blanco	1,849	10.3%	Donley	375	1.4%	Howard	23,173	73.0%
Borden	8,550	66.7%	Duval	0	0%	Hudspeth	0	0%
Bosque	1,268	2.5%	Eastland	1,703	5.7%	Hunt	6,811	8.1%
Bowie	0	0%	Ector	0	0%	Hutchinson	2,964	4.7%
Brazoria	125,512	20.7%	Edwards	0	0%	Irion	0	0%
Brazos	5,411	5.0%	Ellis	37,449	18.4%	Jack	10,314	18.5%
Brewster	3,293	20.7%	El Paso	149,595	16.8%	Jackson	6,890	9.3%
Briscoe	710	18.7%	Erath	5,903	7.3%	Jasper	3,388	6.4%
Brooks	0	0%	Falls	46,498	25.3%	Jeff Davis	0	0%
Brown	1,224	1.5%	Fannin	15,215	15.5%	Jefferson	73,220	23.9%
Burleson	9,301	17.3%	Fayette	7,371	5.2%	Jim Hogg	0	0%
Burnet	1,996	6.9%	Fisher	11,256	14.2%	Jim Wells	4,451	16.0%
Caldwell	708	0.9%	Floyd	455	100.0%	Johnson	7,632	5.2%
Calhoun	2,830	9.2%	Foard	1,694	17.6%	Jones	4,467	7.9%
Callahan	14,382	51.0%	Fort Bend	77,879	11.4%	Karnes	336	0.5%
Cameron	7,709	1.6%	Franklin	1,700	11.3%	Kaufman	4,641	14.4%
Camp	0	0%	Freestone	5,172	14.6%	Kendall	725	1.4%
Carson	0	0%	Frio	1,120	8.7%	Kenedy	0	0%
Cass	984	4.9%	Gaines	0	0%	Kent	4,047	41.9%
Castro	0	0%	Galveston	12,271	2.3%	Kerr	4,849	7.2%
Chambers	14,169	28.7%	Garza	0	0%	Kimble	0	0%
Cherokee	19,367	35.2%	Gillespie	2,371	6.4%	King	0	0%
Childress	0	0%	Glasscock	0	0%	Kinney	0	0%
Clay	0	0%	Goliad	510	0.6%	Kleberg	1,950	19.9%
Cochran	0	0%	Gonzales	5,021	9.8%	Knox	808	19.5%
Coke	423	1.2%	Gray	20,807	48.0%	Lamar	2,366	2.6%
Coleman	0	0%	Grayson	12,759	3.2%	Lamb	0	0%
Collin	2,772	0.1%	Gregg	9,378	6.8%	Lampasas	1,056	2.8%
Collings-worth	1,996	12.2%	Grimes	10,662	14.4%	LaSalle	6,161	25.3%
Colorado	6,086	5.4%	Guadalupe	3,126	10.8%	Lavaca	9,574	4.3%
Comal	0	0%	Hale	0	0%	Lee	480	0.7%
Comanche	6,781	6.1%	Hall	2,255	10.9%	Leon	4,904	19.2%
Concho	0	0%	Hamilton	7,649	8.2%	Liberty	13,780	27.6%
Cooke	12,832	8.4%	Hansford	15,238	95.6%	Limestone	15,437	12.2%

Table A-6 (Continued). Sub-standard-for-Load-Only Off-system Span-type Bridge Deck Area by County, Showing Percent, in September 2002

County	Sub-standard-for-Load-Only Bridges		County	Sub-standard-for-Load-Only Bridges		County	Sub-standard-for-Load-Only Bridges	
	Deck Area (Sq. Ft.)	% of Off-system Deck Area		Deck Area (Sq. Ft.)	% of Off-system Deck Area		Deck Area (Sq. Ft.)	% of Off-system Deck Area
Lipscomb	620	32.3%	Parker	47,445	23.3%	Tarrant	11,242	0.4%
Live Oak	4,981	16.3%	Parmer	0	0%	Taylor	11,212	7.5%
Llano	480	7.8%	Pecos	0	0%	Terrell	0	0%
Loving	0	0%	Polk	8,919	12.9%	Terry	0	0%
Lubbock	0	0%	Potter	3,836	1.7%	Throckmor-ton	780	6.4%
Lynn	0	0%	Presidio	0	0%	Titus	4,444	7.6%
Madison	3,673	21.7%	Rains	511	5.3%	Tom Green	4,223	2.0%
Marion	0	0%	Randall	0	0%	Travis	4,031	0.2%
Martin	0	0%	Reagan	0	0%	Trinity	1,844	8.1%
Mason	1,929	22.0%	Real	0	0%	Tyler	7,416	18.9%
Matagorda	27,076	17.4%	Red River	3,736	9.6%	Upshur	0	0%
Maverick	3,443	1.8%	Reeves	0	0%	Upton	0	0%
McCulloch	1,188	5.0%	Refugio	1,065	2.6%	Uvalde	0	0%
McLennan	38,530	5.9%	Roberts	0	0%	Val Verde	0	0%
McMullen	756	32.5%	Robertson	6,455	12.0%	Van Zandt	9,009	17.3%
Medina	2,222	5.5%	Rockwall	2,417	36.4%	Victoria	74,150	33.6%
Menard	0	0%	Runnels	23,478	38.6%	Walker	3,228	11.1%
Midland	0	0%	Rusk	22,911	17.6%	Waller	24,084	27.0%
Milam	2,368	2.6%	Sabine	1,496	4.7%	Ward	0	0%
Mills	964	4.6%	San Augustine	4,285	28.3%	Washing-ton	9,493	8.7%
Mitchell	5,500	12.7%	San Jacinto	1,881	7.8%	Webb	0	0%
Montague	7,309	6.9%	San Patricio	0	0%	Wharton	61,080	23.7%
Montgom-ery	9,089	2.1%	San Saba	1,808	6.5%	Wheeler	3,872	20.3%
Moore	486	27.2%	Schleicher	0	0%	Wichita	532	0.7%
Morris	0	0%	Scurry	7,915	15.9%	Wilbarger	4,221	13.1%
Motley	1,179	8.6%	Shackel-ford	2,998	12.3%	Willacy	9,669	7.6%
Nacog-doches	1,166	0.7%	Shelby	12,149	22.0%	Williamson	7,991	2.0%
Navarro	17,138	14.9%	Sherman	0	0%	Wilson	2,615	3.6%
Newton	3,414	10.1%	Smith	33,735	25.4%	Winkler	0	0%
Nolan	6,606	24.8%	Somervell	0	0%	Wise	21,157	14.3%
Nueces	24,702	12.7%	Starr	429	0.7%	Wood	373	2.4%
Ochiltree	0	0%	Stephens	2,474	5.0%	Yoakum	0	0%
Oldham	0	0%	Sterling	0	0%	Young	788	2.7%
Orange	80,511	62.7%	Stonewall	1,196	3.1%	Zapata	0	0%
Palo Pinto	6,740	11.7%	Sutton	0	0%	Zavala	0	0%
Panola	0	0%	Swisher	1,058	17.8%			

Appendix B – FY 2002 PWP/EMP Annual Report

Background. On July 27, 2000, an amendment to 43 TAC Section 15.55 relating to changes in the local funding requirements of Category 6 projects received final approval by the Commission and became effective August 20, 2000. This rule change instituted is referred to as the department's Participation-Waived Project (PWP) program. An additional amendment to this rule that became effective on November 14, 2001, expanded the types of work that qualified for this program and made the program more flexible.

The usual federal-state-local government cost-participation percentages required on off-system bridge projects is 80-10-10. However, the August 2000 amendment to Article 15.55 allowed the 10% local government cost participation to be waived if the local government agreed to use an equivalent dollar-amount to improve other deficient structures under its jurisdiction. The project on which the 10% local cost participation is waived is referred to as the participation-waived project, while the project(s) to be performed by the local government in return for the waiver is referred to as the equivalent-match project(s) (EMP). The November 2001 amendment expanded the types of work that qualify for equivalent-match projects to include safety related work and clarified the type of structures on which this work could be performed to include low water crossings. It also allowed local governments to perform EMP work in geographically adjacent governmental units.

The participation-waived projects must be Priority 1- or Priority 2-authorized in the Unified Transportation Program Category 6B. For the purposes of this program, eligible structures for address under equivalent-match projects not only include those meeting the Federal Highway Administration (FHWA) bridge definition that are deficient-classified, but also include mainlane cross-drainage structures and low water crossings that do not meet the FHWA bridge definition but are deficient. The equivalent-match bridge or mainlane cross-drainage structure must be classified as deficient, or be weight-restricted for school buses.

This program has expanded the number of local governments participating in our off-system bridge program and has provided many other local governments with the incentive to increase their participation. Through the equivalent-match projects, many structures that had deficiencies but which were not programmed in our off-system bridge program have been scheduled for improvements that will increase their safety and efficiency. Overall, the program should accelerate the rate at which structurally deficient and functionally obsolete off-system bridges are improved throughout the state.

The following report presents a summary of the PWP program for FY 2002. These PWP/EMP reports are issued annually and provide information on both the current fiscal year's results and the cumulative results of the program up to the time of this report.

The Bridge Division maintains a complete database containing all participation-waived projects and their associated equivalent-match projects, by district. The database includes dates for the lettings of PWP projects, both the required and actual completion dates for the EMP projects,

and an indication of any EMP projects that are overdue. The districts provide information for these dates annually during the month of November.

FY 2002 Summary. For FY 2002, 21 of the 25 districts executed participation-waived off-system bridge project agreements, for a total of 242 participation-waived projects and 418 equivalent-match projects. Cost estimates for the 242 participation-waived projects total $77.94M with total local participation of $7.46M, of which $7.16M has been waived.

Of the 418 equivalent-match projects having a $8.92M total estimated cost, 156 (37%) are on the National Bridge Inventory (NBI) for an estimated cost of $5.73M, and 262 (63%) are local projects not on the NBI for an estimated cost of $3.20M.

Of the 418 equivalent-match projects, 329 (79%) are on school bus routes. Of the 156 equivalent-match projects on the NBI, 128 (82%) are on school bus routes. Of the 262 local projects not on the NBI, 201 (77%) are on school bus routes.

Of the 242 participation-waived projects with agreements executed in FY 2002, 59 (24%) have been let to contract. Of the 418 associated equivalent-match projects, 47 (11%) have been completed.

Update on FY 2001 Activity. Of the 217 participation-waived projects with agreements executed in FY 2001, 152 (70%) have been let to contract. Of the 338 associated equivalent-match projects, 100 (30%) have been completed.

Update on Activity since Initiation in FY 2001. Since the program was initiated in FY 2001, 21 of the 25 districts have executed participation-waived off-system bridge project agreements, for a total of 459 participation-waived projects and 756 equivalent-match projects. Cost estimates for the 459 participation-waived projects total $135.15M with total local participation of $12.72M, of which $11.94M has been waived.

Of the 756 equivalent-match projects having a $15.23M total estimated cost, 284 (38%) are on the National Bridge Inventory (NBI) for an estimated cost of $10.25M, and 472 (62%) are local projects not on the NBI for an estimated cost of $4.98M.

Of the 756 equivalent-match projects, 594 (79%) are on school bus routes. Of the 284 equivalent-match projects on the NBI, 233 (82%) are on school bus routes. Of the 472 local projects not on the NBI, 361 (76%) are on school bus routes.

Of the 459 participation-waived projects with agreements executed since the initiation of the program in FY 2001, 211 (46%) have been let to contract. Of the 756 associated equivalent-match projects, 147 (19%) have been completed.

Attachments. The following attachments are appended to this report:
- Attachment A – FY 2001 Summary of Participation Waived Project Information
- Attachment B – FY 2002 Summary of Participation Waived Project Information
- Attachment C – Cumulative Summary of PWP/EMP Projects

- Attachment D – Summary of PWP/EMP Projects
- Attachment E – Summary of PWP/EMP $ Amounts
- Attachment F – Off-System Bridge Inventory 1999-2002

Questions concerning the participation-waived project program may be addressed to Michael S. O'Toole, P.E., Director of Project Development in the Bridge Division, at telephone number (512) 416-2240.

Attachment A

FY2001 Summary of Participation Waived Project Information
Updated 11/17/2002

District	No. of PWPs	No. of EMPs	EMPs on NBI	EMP(NBI) on School Bus Rt.	EMP(nonNBI) on School Bus Rt.	Total PWP Project Estimates	Total Local Participation Amounts	$ Amt for EMP (NBI)	$ Amt for EMP (nonNBI)	Total $ Amount waived for PWPs	PWP Projects Let to Contract	EMP Projects Completed	EMP Projects Overdue
(08) ABL	3	5	5	0	0	$832,221	$80,012	$87,000		$80,012	3	1	
(04) AMA													
(19) ATL	16	11	0	0	11	$3,884,939	$324,579		$305,077	$265,786	7	0	
(14) AUS	7	12	8	7	3	$3,312,495	$331,249	$937,283	$86,866	$296,565	6	10	
(20) BMT													
(23) BWD	7	35	0	0	32	$1,621,000	$162,100		$171,603	$162,100	6	10	
(17) BRY	10	10	9	9	1	$2,968,046	$288,643	$212,888	$6,300	$204,218	4	8	
(25) CHS	21	53	5	2	9	$3,314,922	$263,432	$36,875	$256,064	$245,919	17	0	
(16) CRP	5	1	1	1	0	$1,077,700	$107,770	$117,473		$107,770	0	0	
(18) DAL													
(24) ELP													
(02) FTW	39	41	39	38	2	$12,930,197	$1,237,376	$1,392,900	$30,400	$1,161,158	22	8	
(12) HOU													
(22) LRD													
(05) LBB													
(11) LKF	12	55	5	3	47	$3,888,034	$323,831	$127,860	$220,167	$303,852	8	20	
(06) ODA													
(01) PAR	33	34	15	14	19	$4,625,571	$401,394	$273,550	$116,664	$385,704	33	7	
(21) PHR	4	1	1	1	0	$991,497	$41,190	$37,796		$37,795	3	1	
(07) SJT													
(15) SAT													
(10) TYL	6	5	5	4	0	$2,425,634	$168,005	$167,338		$163,505	4	0	
(09) WAC	8	11	11	10	0	$3,063,000	$306,300	$281,710		$244,358	8	8	
(03) WFS	21	25	5	5	20	$4,174,114	$417,420	$135,225	$427,451	$367,653	15	12	
(13) YKM	25	39	19	11	16	$8,103,029	$810,262	$714,084	$160,055	$752,139	16	15	
Totals	217	338	128	105	160	$57,212,399	$5,263,563	$4,521,982	$1,780,647	$4,778,534	152	100	0

Attachment B

FY2002 Summary of Participation Waived Project Information
Updated 11/17/2002

Updated 11/17/2002	No. of PWPs	No. of EMPs	EMPs on NBI	EMP(NBI) onSchool Bus Rt.	EMP(non NBI) on School Bus Rt.	Total PWP Project Estimates	Total Local Participation Amounts	$ Amt for EMP (NBI)	$ Amt for EMP (nonNBI)	Total $ Amount waived for PWPs	PWP Projects Let to Contract	EMP Projects Completed	EMP Projects Overdue
(08) ABL	10	14	10	1	0	$2,153,544	$206,442	$236,398	$33,232	$200,190	4	3	
(04) AMA	3	22	17	15	4	$7,815,081	$781,508	$304,055	$485,000	$780,475	2	0	
(19) ATL	1	1	0	0	1	$227,215	$22,721		$18,020	$18,020	0	0	
(14) AUS	22	31	5	1	19	$7,035,845	$703,583	$651,189	$487,709	$701,711	1	4	
(20) BMT	1	6	0	0	6	$663,243	$66,324		$64,241	$61,734	1	0	
(23) BWD	14	79	0	0	43	$3,698,600	$322,560		$388,294	$322,560	13	8	
(17) BRY	15	17	11	11	6	$5,848,217	$451,848	$306,610	$76,886	$368,744	1	9	
(25) CHS	12	30	3	3	23	$1,488,300	$148,830	$26,600	$132,400	$148,830	1	0	
(16) CRP	17	8	5	5	3	$3,705,278	$370,528	$505,617	$67,522	$370,528	0	1	
(18) DAL	17	7	6	5	1	$3,945,054	$394,507	$437,928	$33,000	$360,932	0	0	
(24) ELP													
(02) FTW	33	34	32	31	2	$11,392,846	$1,139,285	$1,249,700	$39,600	$1,124,135	7	0	
(12) HOU	2	2	1	1	1	$1,149,500	$114,950	$114,103	$358,000	$114,950	0	0	
(22) LRD													
(05) LBB													
(11) LKF	6	10	3	1	7	$993,377	$80,165	$41,480	$45,279	$80,165	0	0	
(06) ODA													
(01) PAR	26	36	15	15	21	$4,795,498	$450,978	$382,913	$88,701	$437,251	10	2	
(21) PHR	4	2	2	2	0	$1,269,314	$44,383	$66,000		$36,137	0	1	
(07) SJT	1	1	1	1	0	$563,850	$56,385	$57,000		$56,385	0	0	
(15) SAT	4	10	1	1	9	$3,808,741	$380,875	$70,516	$310,400	$356,875	2	0	
(10) TYL	5	12	12	12	0	$2,677,350	$248,457	$304,702		$248,457	0	0	
(09) WAC	14	40	26	18	14	$7,422,466	$742,246	$675,250	$124,069	$699,496	5	6	
(03) WFS	21	30	1	1	29	$3,094,420	$309,442	$54,078	$265,273	$290,548	6	7	
(13) YKM	14	26	5	4	12	$4,190,446	$419,045	$242,500	$180,553	$382,709	6	6	
Totals	242	418	156	128	201	$77,938,185	$7,455,062	$5,726,639	$3,198,179	$7,160,832	59	47	0

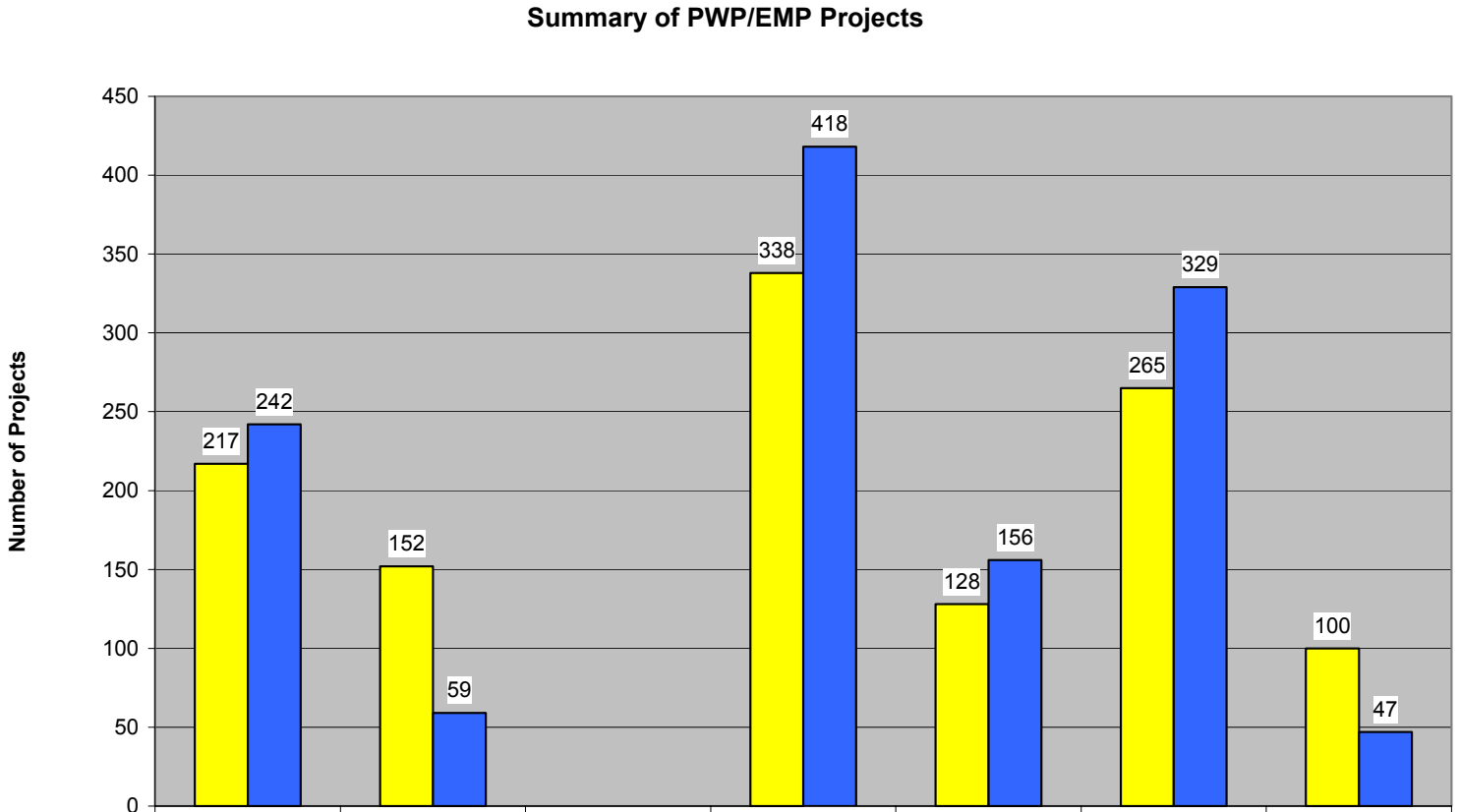
Attachment C

Cumulative Summary of Participation Waived Project Information

Updated 11/17/2002

	No. of PWPs	No. of EMPs	EMPs on NBI	EMP(NBI) on School Bus Rt.	EMP(non-NBI) on School Bus Rt.	Total PWP Project Estimates	Total Local Participation Amounts	$ Amt for EMP (NBI)	$ Amt for EMP (nonNBI)	Total $ Amount waived for PWPs	PWP ProjectsLet to Contract	EMP Projects Completed	EMP Projects Overdue
FY2001	217	338	128	105	160	$57,212,399	$5,263,563	$4,521,982	$1,780,647	$4,778,534	152	100	0
FY2002	242	418	156	128	201	$77,938,185	$7,455,062	$5,726,639	$3,198,179	$7,160,832	59	47	0
TOTAL	459	756	284	233	361	$135,150,584	$12,718,625	$10,248,621	$4,978,826	$11,939,366	211	147	0

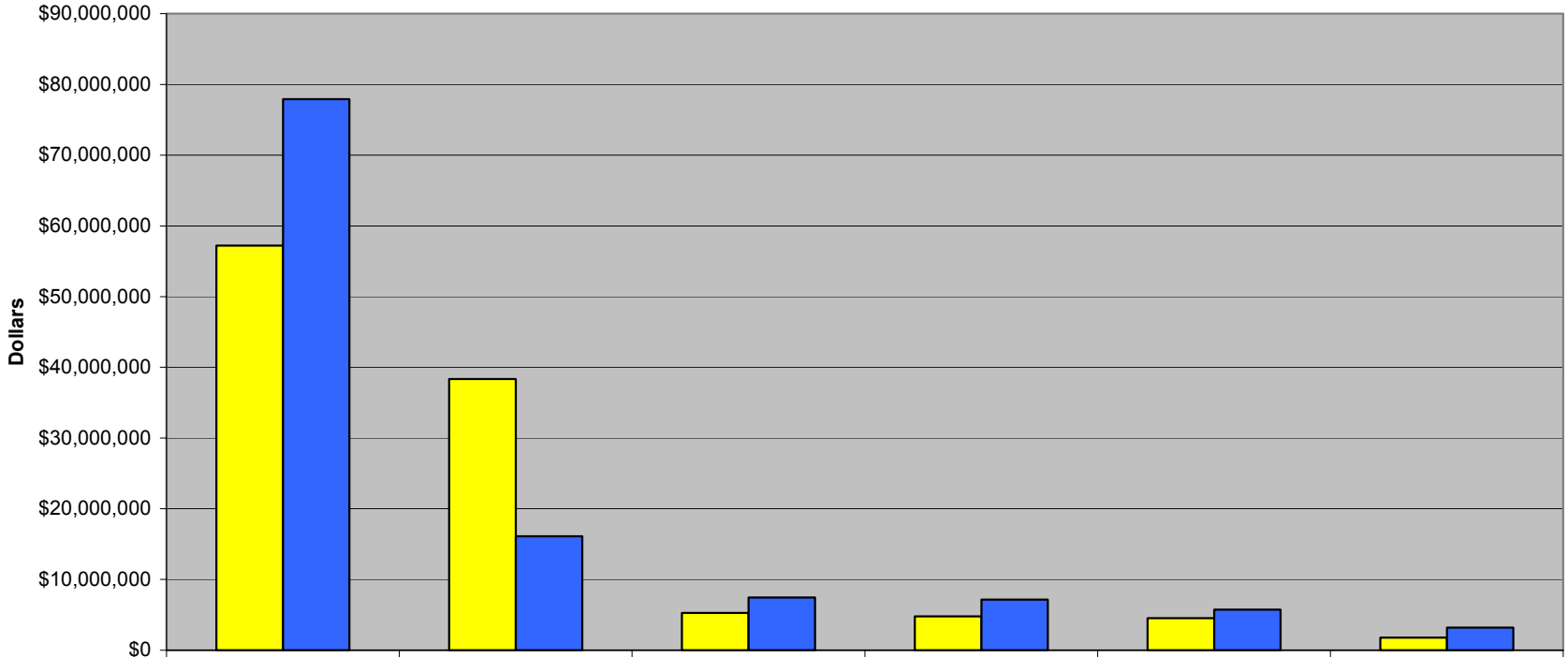
Attachment D



	No. of PWP Agreements Executed in FY	PWPs Let to date for PWPs Executed in FY		No. of EMPs	EMPs on the NBI	EMPs on School Bus Rt.	EMPs Completed to date for PWPs Executed in FY
FY 2001	217	152		338	128	265	100
FY 2002	242	59		418	156	329	47

Attachment E

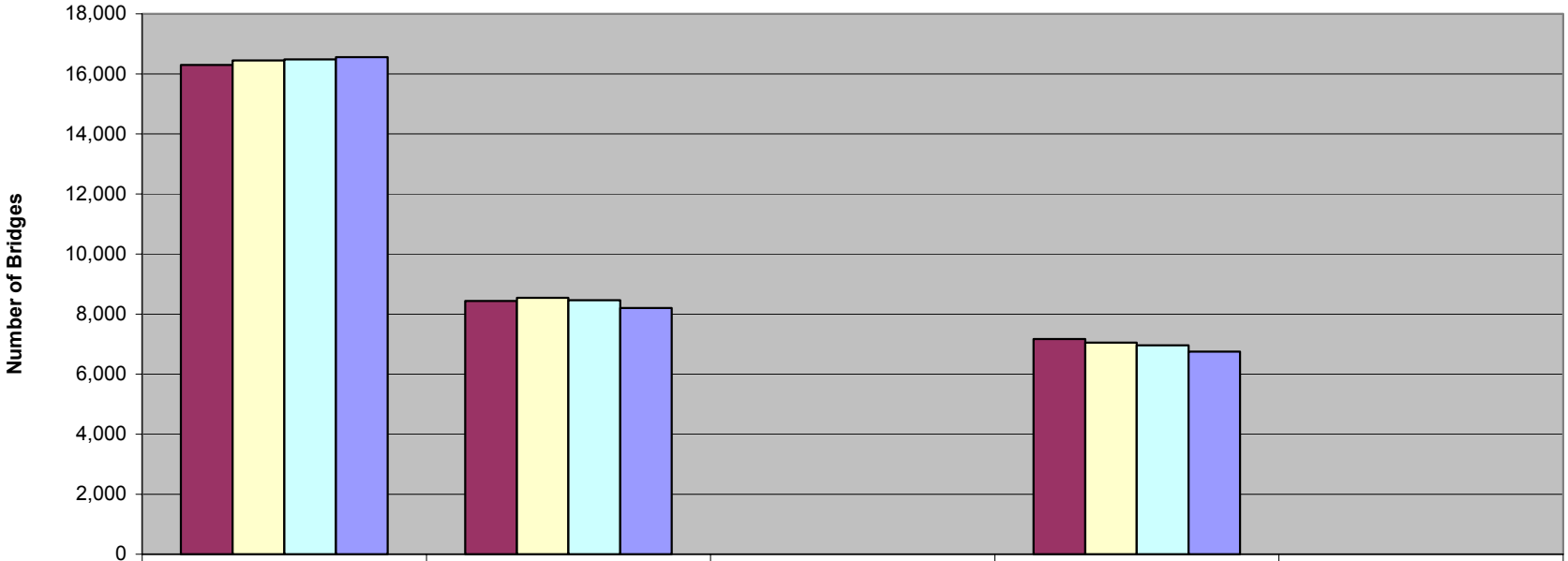
Summary of PWP/EMP $ Amounts



	Total PWP Project Estimates	$ Amt for PWPs Let to date for PWPs Executed in FY	Total Required Local Participation Amounts for PWPs	Total $ Amount Waived for PWPs	$ Amount for EMPs (NBI)	$ Amount for EMPs (nonNBI)
FY 2001	$57,212,399	$38,350,149	$5,263,563	$4,778,534	$4,521,982	$1,780,647
FY 2002	$77,938,185	$16,110,162	$7,455,062	$7,160,832	$5,726,639	$3,198,179

Attachment F

Off-System Bridge Inventory FY1999-FY2002
(based on Sept. Pocket Facts)



	Total Off-System Bridges	Deficient/Obsolete Bridges Including Substandard for Load Capacity Only	% Deficient/Obsolete Including Substandard for Load Capacity Only	Deficient/Obsolete by FHWA Criteria Only	% Deficient/Obsolete by FHWA Criteria Only
FY 1999	16,300	8,440	51.8%	7,170	44.0%
FY 2000	16,448	8,538	51.9%	7,046	42.8%
FY 2001	16,476	8,461	51.4%	6,957	42.2%
FY 2002	16,560	8,205	49.6%	6,748	40.8%

Appendix C – Texas Counties and TxDOT Districts

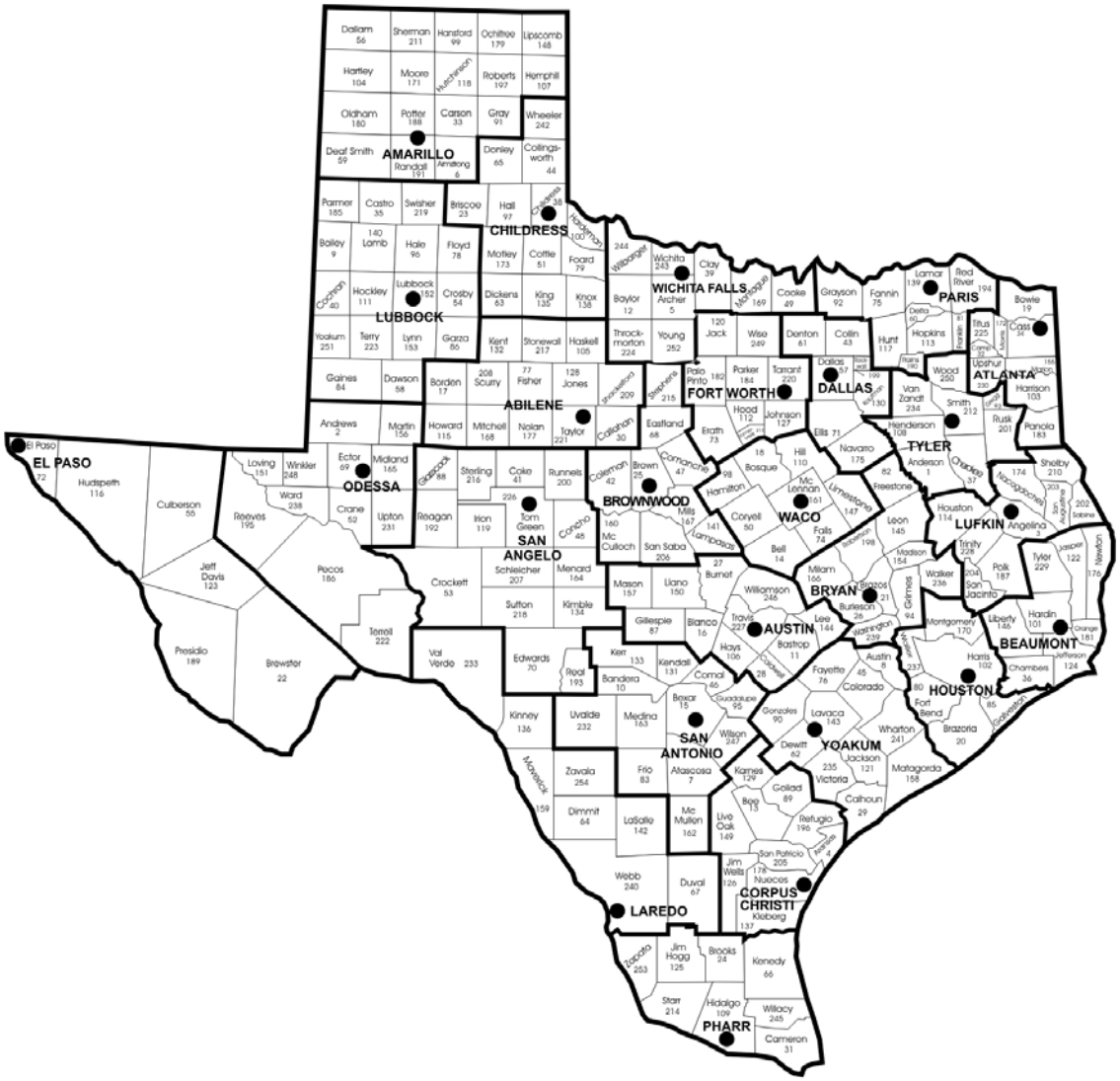


Figure C-1. Texas Counties and TxDOT Districts

Table C-1. Texas Counties, County Numbers, and TxDOT District

County	County Number	TxDOT District	County	County Number	TxDOT District	County	County Number	TxDOT District
Anderson	1	Tyler	Coryell	50	Waco	Hardeman	100	Childress
Andrews	2	Odessa	Cottle	51	Childress	Hardin	101	Beaumont
Angelina	3	Lufkin	Crane	52	Odessa	Harris	102	Houston
Aransas	4	Corpus Christi	Crockett	53	San Angelo	Harrison	103	Atlanta
Archer	5	Wichita Falls	Crosby	54	Lubbock	Hartley	104	Amarillo
Armstrong	6	Amarillo	Culberson	55	El Paso	Haskell	105	Abilene
Atascosa	7	San Antonio	Dallam	56	Amarillo	Hays	106	Austin
Austin	8	Yoakum	Dallas	57	Dallas	Hemphill	107	Amarillo
Bailey	9	Lubbock	Dawson	58	Lubbock	Henderson	108	Tyler
Bandera	10	San Antonio	Deaf Smith	59	Amarillo	Hidalgo	109	Pharr
Bastrop	11	Austin	Delta	60	Paris	Hill	110	Waco
Baylor	12	Wichita Falls	Denton	61	Dallas	Hockley	111	Lubbock
Bee	13	Corpus Christi	Dewitt	62	Yoakum	Hood	112	Fort Worth
Bell	14	Waco	Dickens	63	Childress	Hopkins	113	Paris
Bexar	15	San Antonio	Dimmit	64	Laredo	Houston	114	Lufkin
Blanco	16	Austin	Donley	65	Childress	Howard	115	Abilene
Borden	17	Abilene	Duval	67	Laredo	Hudspeth	116	El Paso
Bosque	18	Waco	Eastland	68	Brownwood	Hunt	117	Paris
Bowie	19	Atlanta	Ector	69	Odessa	Hutchinson	118	Amarillo
Brazoria	20	Houston	Edwards	70	San Angelo	Irion	119	San Angelo
Brazos	21	Bryan	Ellis	71	Dallas	Jack	120	Fort Worth
Brewster	22	El Paso	El Paso	72	El Paso	Jackson	121	Yoakum
Briscoe	23	Childress	Erath	73	Fort Worth	Jasper	122	Beaumont
Brooks	24	Pharr	Falls	74	Waco	Jeff Davis	123	El Paso
Brown	25	Brownwood	Fannin	75	Paris	Jefferson	124	Beaumont
Burleson	26	Bryan	Fayette	76	Yoakum	Jim Hogg	125	Pharr
Burnet	27	Austin	Fisher	77	Abilene	Jim Wells	126	Corpus Christi
Caldwell	28	Austin	Floyd	78	Lubbock	Johnson	127	Fort Worth
Calhoun	29	Yoakum	Foard	79	Childress	Jones	128	Abilene
Callahan	30	Abilene	Fort Bend	80	Houston	Karnes	129	Corpus Christi
Cameron	31	Pharr	Franklin	81	Paris	Kaufman	130	Dallas
Camp	32	Atlanta	Freestone	82	Bryan	Kendall	131	San Antonio
Carson	33	Amarillo	Frio	83	San Antonio	Kenedy	66	Pharr
Cass	34	Atlanta	Gaines	84	Lubbock	Kent	132	Abilene
Castro	35	Lubbock	Galveston	85	Houston	Kerr	133	San Antonio
Chambers	36	Beaumont	Garza	86	Lubbock	Kimble	134	San Angelo
Cherokee	37	Tyler	Gillespie	87	Austin	King	135	Childress
Childress	38	Childress	Glasscock	88	San Angelo	Kinney	136	Laredo
Clay	39	Wichita Falls	Goliad	89	Corpus Christi	Kleberg	137	Corpus Christi
Cochran	40	Lubbock	Gonzales	90	Yoakum	Knox	138	Childress
Coke	41	San Angelo	Gray	91	Amarillo	Lamar	139	Paris
Coleman	42	Brownwood	Grayson	92	Paris	Lamb	140	Lubbock
Collin	43	Dallas	Gregg	93	Tyler	Lampasas	141	Brownwood
Collings-worth	44	Childress	Grimes	94	Bryan	LaSalle	142	Laredo
Colorado	45	Yoakum	Guadalupe	95	San Antonio	Lavaca	143	Yoakum
Comal	46	San Antonio	Hale	96	Lubbock	Lee	144	Austin
Comanche	47	Brownwood	Hall	97	Childress	Leon	145	Bryan
Concho	48	San Angelo	Hamilton	98	Waco	Liberty	146	Beaumont
Cooke	49	Wichita Falls	Hansford	99	Amarillo	Limestone	147	Waco

Table C-1 (Continued). Texas Counties, County Numbers, and TxDOT District

County	County Number	TxDOT District	County	County Number	TxDOT District	County	County Number	TxDOT District
Lipscomb	148	Amarillo	Parker	184	Fort Worth	Tarrant	220	Fort Worth
Live Oak	149	Corpus Christi	Parmer	185	Lubbock	Taylor	221	Abilene
Llano	150	Austin	Pecos	186	Odessa	Terrell	222	Odessa
Loving	151	Odessa	Polk	187	Lufkin	Terry	223	Lubbock
Lubbock	152	Lubbock	Potter	188	Amarillo	Throckmor-ton	224	Wichita Falls
Lynn	153	Lubbock	Presidio	189	El Paso	Titus	225	Atlanta
Madison	154	Bryan	Rains	190	Paris	Tom Green	226	San Angelo
Marion	155	Atlanta	Randall	191	Amarillo	Travis	227	Austin
Martin	156	Odessa	Reagan	192	San Angelo	Trinity	228	Lufkin
Mason	157	Austin	Real	193	San Angelo	Tyler	229	Beaumont
Matagorda	158	Yoakum	Red River	194	Paris	Upshur	230	Atlanta
Maverick	159	Laredo	Reeves	195	Odessa	Upton	231	Odessa
McCulloch	160	Brownwood	Refugio	196	Corpus Christi	Uvalde	232	San Antonio
McLennan	161	Waco	Roberts	197	Amarillo	Val Verde	233	Laredo
McMullen	162	San Antonio	Robertson	198	Bryan	Van Zandt	234	Tyler
Medina	163	San Antonio	Rockwall	199	Dallas	Victoria	235	Yoakum
Menard	164	San Angelo	Runnels	200	San Angelo	Walker	236	Bryan
Midland	165	Odessa	Rusk	201	Tyler	Waller	237	Houston
Milam	166	Bryan	Sabine	202	Lufkin	Ward	238	Odessa
Mills	167	Brownwood	San Augustine	203	Lufkin	Washing-ton	239	Bryan
Mitchell	168	Abiline	San Jacinto	204	Lufkin	Webb	240	Laredo
Montague	169	Wichita Falls	San Patricio	205	Corpus Christi	Wharton	241	Yoakum
Montgom-ery	170	Houston	San Saba	206	Brownwood	Wheeler	242	Childress
Moore	171	Amarillo	Schleicher	207	San Angelo	Wichita	243	Wichita Falls
Morris	172	Atlanta	Scurry	208	Abilene	Wilbarger	244	Wichita Falls
Motley	173	Childress	Shackel-ford	209	Abilene	Willacy	245	Pharr
Nacog-doches	174	Lufkin	Shelby	210	Lufkin	Williamson	246	Austin
Navarro	175	Dallas	Sherman	211	Amarillo	Wilson	247	San Antonio
Newton	176	Beaumont	Smith	212	Tyler	Winkler	248	Odessa
Nolan	177	Abilene	Somervell	213	Fort Worth	Wise	249	Fort Worth
Nueces	178	Corpus Christi	Starr	214	Pharr	Wood	250	Tyler
Ochiltree	179	Amarillo	Stephens	215	Brownwood	Yoakum	251	Lubbock
Oldham	180	Amarillo	Sterling	216	San Angelo	Young	252	Wichita Falls
Orange	181	Beaumont	Stonewall	217	Abilene	Zapata	253	Pharr
Palo Pinto	182	Fort Worth	Sutton	218	San Angelo	Zavala	254	Laredo
Panola	183	Atlanta	Swisher	219	Lubbock			

Texas Department of Transportation

Bridge Division